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The University of the State of New York

STATE MUSEUM

JOHN M. CLARKE, Director

Memoir 15

WILD FLOWERS OF NEW YORK

IN TWO PARTS

BY

HOMER D. HOUSE

State Botanist

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ALBANY

THE UNIVERSITY OF THE STATE OF NEW YORK

1918

THE UNIVERSITY OF THE STATE OF NEW YORK

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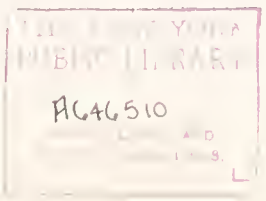
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LETTER OF COMMUNICATION

New York State Museum
January 30, 1918

The Honorable John H. Finley
President of the University

SIR:

The scientific survey of this State, established in 1836 under the title "The Natural History of New York," embraces in its monumental reports two volumes treating of the flora of the State. These volumes, prepared by the distinguished botanist, John Torrey, bear the inscription: *Flora of the State of New York; Comprising Full Descriptions of All the Indigenous and Naturalized Plants Hitherto Discovered in the State, with Remarks on Their Economical and Medical Properties* (1843). The species described in this work were entirely of the phenogamous or flowering plants. Until that time no summary of the New York flora had been brought together; and the service rendered to the people of the State by the publication of this compendium was of a high order and was received with enthusiastic appreciation. Doctor Torrey's books served the needs of the time and expressed the state of its knowledge of the New York flora.

Seventy-five years have passed, and in that long stretch of time botanical science has grown widely and apace. The field of cryptogamic botany, that which deals with the flowerless plants, the mushrooms, mosses, lichens and their kind, was not entered in these early reports; it was obscure and little understood; its mostly inconspicuous growths did not attract the eye or invite the observer; nor were its important relations to the economy of the community even suspected.

The early official botanical investigations of the State were formally terminated by the publication of John Torrey's reports. Not till 1867 did the need of continuous official attention to this department of science meet

the recognition of the Regents of the University. In that year Charles Horton Peck was designated to take charge of such botanical collections as had accumulated in the State Museum, and not long thereafter Mr Peck was officially appointed the State Botanist. To the botanical service of the State Mr Peck thereafter dedicated himself without reserve for the rest of his long life. He added much to the store of knowledge of the flowering plants, but the veiled world of the flowerless plants the more invited him and to it he specially gave his labors; leaving behind him a harvest of knowledge of them and a repute for his intricate researches which ranks him high on the roll of great botanists. Doctor Peck spared no effort, however, to increase the store of knowledge of all the flora of the State and he is the creator of the large state herbarium. After fifty years of unstinted devotion to his science and to his State, Doctor Peck fell asleep in honor, in the year 1917.

Since the date of Torrey's report, the flowering plants have been the subject of study in all parts of the Commonwealth. Botanical societies and local students have multiplied; records have grown; the demand for information has greatly increased; but there has been no reliable exposition of such information accessible to these students.

It has been with this purpose of meeting a wide demand and of setting forth with such excellence as present knowledge and perfected modes of illustration could afford, that the present work, *The Wild Flowers of New York*, has been projected. The undertaking, bound to be an arduous one, has not been entered upon hastily. The advice of the leading botanists of this State and country was sought as to its timeliness, its scope, mode of presentation and illustration. The interested public will find it to be not a highly technical guide, couched in closely analytical descriptions, but a comparatively brief text, untechnical so far as the theme permits, accompanied by color illustrations made from the growing plants. The present State Botanist, Dr Homer D. House, is the responsible author of the work; he has not only prepared the text and its arrangement, but has supervised in detail the color photography; he has accompanied the photographers

into the field on every visit and has selected every subject which is here reproduced.

The color illustrations must speak for themselves. They have been executed with most painstaking care by the quadricolor process, and the living and growing plants have been reproduced in their colors as near to those of nature as now seems possible. Credit for the printing and binding of the work should be given to the J. B. Lyon Company of Albany, but the Matthews-Northrup Company of Buffalo and the Zeese-Wilkinson Company of New York are to be accredited with the quality and making of the color plates.

As such, then, these volumes are given to the people of the State and as such, we believe, they would have this service rendered.

Very respectfully

JOHN M. CLARKE

Director

One who is upon the gray oeean at this season of the year when, in the woods and at the roadsides in the State of New York, the wild flowers are beginning to redeem their promises of life, appreciates as never before how mueh these quiet, persistent pioneers of the fields eontribute in seent, eolor and form to the making of that whieh is summed up in the name *New York;* even as the heather to the making of that eountry whose headlands are now dimly emerging from the level sea. The sight of a spray of these native flowers, sueh as many a page in this book earries, would be as a twig borne back in aneient times to the ark — a sign that, though the flood of war has overwhelmed many valleys, the elemental proeesses of life go forward undisturbed in the "Empire State." Whatever the eeonomic value or imputed harm of these aborigines, first settlers, later immigrants and vagrants which together eonstitute the Flora of the State, it is desirable from every point of view, sinee they are our near, most weleome but sometimes intrusive neighbors, that we should know their faees, their habits and their capaeities for good or warning of ill. It is a great realm of life within the State of whieh the State as a whole should aeknowledge the possession.

I have unusual satisfaetion in finding it my offieial opportunity to say an introductory word to this notable and distinguished work, because it is the reeord of a possession which the Direetor of the State Museum, Dr John M. Clarke, has enabled the State to make. It has a great praetieal value, but it has another value in making perennial and keeping in perpetual domestic bloom, in home and sehoolhouse and library, flowers that blossom but a few days or weeks in the wild state in whieh they have been so skilfully and sympathetieally diseovered by Doetor House. I am proud that the State has made possible sueh a publication and that The University of the State of New York has been able to exeeute the eommission with sueh sueeess.

President of the University

On the Atlantic Ocean
May 1918

WILD FLOWERS OF NEW YORK

INTRODUCTION

The State of New York possesses a large variety of herbaceous and shrubby plants with conspicuous flowers, which may be classed under the rather broad and indefinite term of "wild flowers." For the purposes of this work only a few of the shrubs, such as the Mountain Laurel, Azalea and Labrador Tea have been included, the thought being to present mainly herbaceous plants with conspicuous flowers.

Anyone who has observed the natural vegetation in such unlike parts of the State as the salt marshes and pine barrens of Long Island, the higher Adirondack and Catskill mountains or the woodlands of the western counties must have been impressed by the obvious difference in the wild flowers of those several sections, and especially by the fact that very few of the wild flowers which bloom between early spring and late autumn in the Adirondacks are to be found on Long Island.

Such differences in the character of the vegetation of widely separated portions of the State are explained partly by soil conditions and partly by differences in climate. Located with the ocean at one side and the great inland lakes at the other, the State is favored by conditions of atmospheric moisture (relative humidity, rainfall and snowfall) which make it climatically a forest region, and hence favorable for a luxuriant variety of herbaceous and shrubby plants; a region in which forests would naturally dominate all other vegetation if not cut down. The temperature conditions along the southern coast of the State are modified by the ocean, and to some extent on the west by the Great Lakes, while the elevated mountain masses of the Adirondack and Catskill regions produce cooler summers and shorter growing seasons.

I am indebted to Mr Edward A. Eames of Buffalo for photographs and autochromes of certain orchids, to Mr G. A. Bailey of Geneseo, and Mr O. O. Nylander of Caribou, Me., for additional photographs and to Mr Louis R. Robbins, former assistant to State Botanist, for assistance in the preparation of the text and illustrations for the chapter on Plant Structure.

PLANT STRUCTURE[1]

No one who loves plants, either cultivated or wild, has failed to note how they differ from one another in shape, size, color and arrangement of the flowers, the leaves and other parts. These features are essentially the same in all individuals of a given species, but differ greatly in individual plants not belonging to the same species or variety.

To express these differences requires a terminology that is familiar largely only to those who have studied botany. The fact that it is practically impossible to describe a plant accurately without the use of a certain number of these special terms is a great impediment to a broad familiarity with our wild flowers on the part of all those who would like to study them with the aid of botanical guides. Because of the great variety of flowering plants and the minuteness of the flowers on many of them, the difficulty of identification is even greater than that connected with the study of bird and animal life.

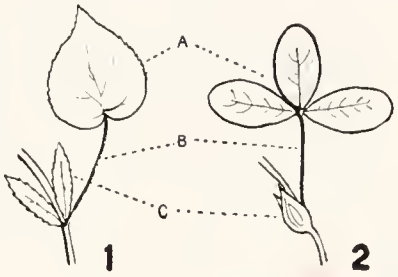
The following brief summary of the terms necessary to an accurate description of a flowering plant, taken alone, means little to the average reader. Taken in connection with the plants as they are found growing and carefully studied, these terms, as soon as understood, place one on a footing of easy familiarity with the wild flowers, so that an accurate description as given in books means something definite and enables one to decide if the given description applies to the plant under consideration. Supplemented by illustrations, a study of the terminology used enables the student to acquire a much wider knowledge of our wild flowers.

Leaves

The leaf is an essential organ of all plants which live independently, that is, are not parasitic upon other plants (like the Dodder) or saprophytic upon dead plant remains (like the Indian Pipe). The leaf manufactures

[1] The cuts in this section are adapted from Gray's Lessons in Botany. Copyright by Asa Gray. Reproduced by permission of the American Book Company, publishers.

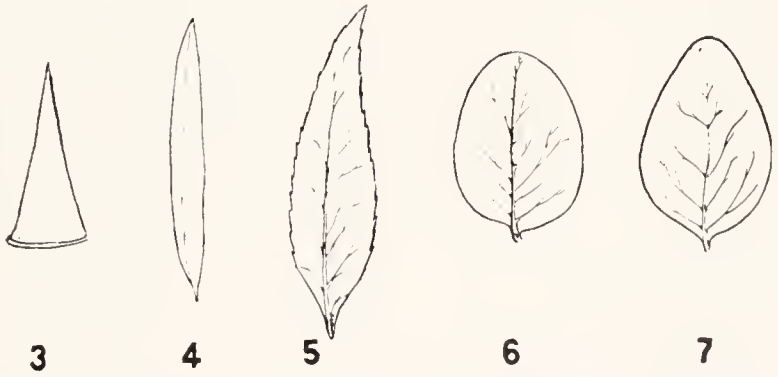
food for the plant, gives off excess water (transpiration) and is the breathing organ of the plant. To accomplish these functions the leaf is built up by a complex arrangement of cells and is variously modified in different groups of plants to meet the external conditions of environment and competition by other plants.



The parts of a leaf are designated as **blade, petiole** and **stipules.** The **leaf blade** (figure 1A) is the broadly expanded portion, although in some species the leaf blade is very narrow or even threadlike. The **petiole** (figure 1B) is the stalk which supports the blade, and may be lacking in some cases, when the leaf is said to be **sessile.** The **stipules** (figure 1C) are small, leaflike organs at the base of the petiole, and are best typified by the rose leaf. Frequently the stipules encircle the stem at the base of the petiole and often they are entirely lacking or fall away so soon after the leaves expand that they are not found when the plant is in bloom.

Terms of leaf outline: The various shapes of leaf blades may be expressed by the following terms:

Subulate; awl-shaped, without visible expansion of blade, and usually tapering to the apex (figure 3).



Linear, or ribbon-shaped; elongated and several times longer than wide (figure 4).

Lanceolate; in whieh the leaf blade is three times as long as wide, or longer, and broadest at or below the middle (figure 5).

Oblong; in which the blade is somewhat longer than wide, broadest in the middle or with sides almost parallel (figure 6).

Ovate; shaped like an egg; that is, broadest below the middle or near the base (figure 7).

Elliptical; rounded at both ends, somewhat longer than wide (figure 8).

Orbicular or **rotund;** in whieh the blade is nearly or quite eireular in outline (figure 9).

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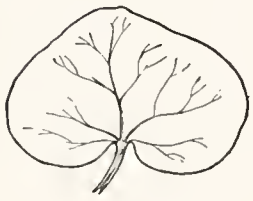

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Reniform; in whieh the blade is broader than long, with a heart-shaped base (figure 10).

Deltoid; triangle-shaped, similar to **ovate** but eonspieuously broadened at the base and pointed at the apex (figure 11).

Consideration of a few leaf blades shows immediately that these terms are not always suffieient to express aeeurately the shape and we may have reeourse to eombinations of terms, sueh as **oblong-lanceolate, ovate-lanceolate** (figure 13), ete.

The shape of leaf blades whieh are broadest above the middle may be expressed by the following terms:

Obovate; ovate in shape, but broadest near the apex or above the middle (figure 14).

Oblanceolate; laneeolate in shape but broadest above the middle or near the apex (figure 15).

Spatulate; in whieh the blade is oblaneeolate or obovate in shape with the base eonspieuously elongated (figure 12).

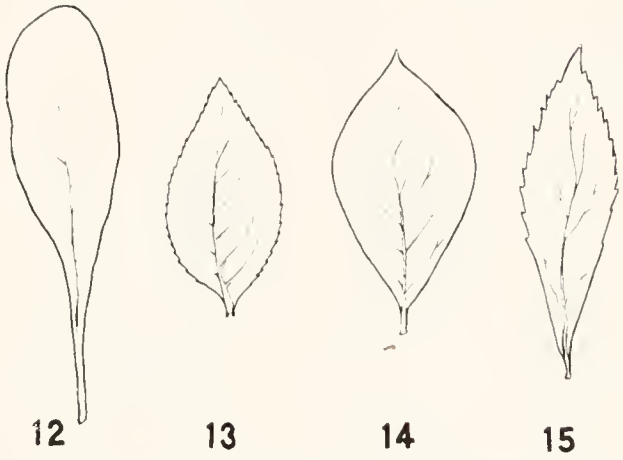
Terms applied to the apex of the leaf:

Obcordate; broad and heart-shaped at the apex (figure 16).

Emarginate; with a slight depression at the somewhat narrowed apex (figure 17).

Retuse; terminating in a semicircular end, the center of which is somewhat indented (figure 18).

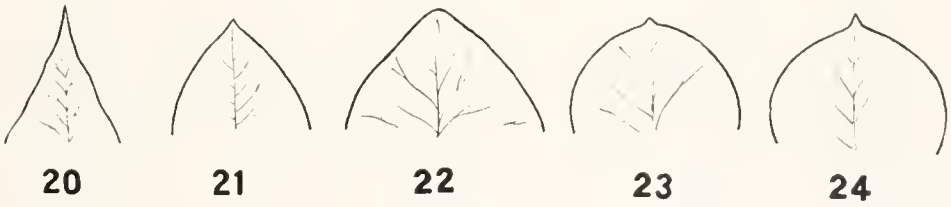
Truncate; with a flat or abrupt apex (figure 19).



Acuminate; when the apex of the blade is longer than broad (figure 20).

Acute; when the apex of the blade is about as broad as long (figure 21).

Obtuse or **blunt;** when the apex is much broader than long (figure 22).

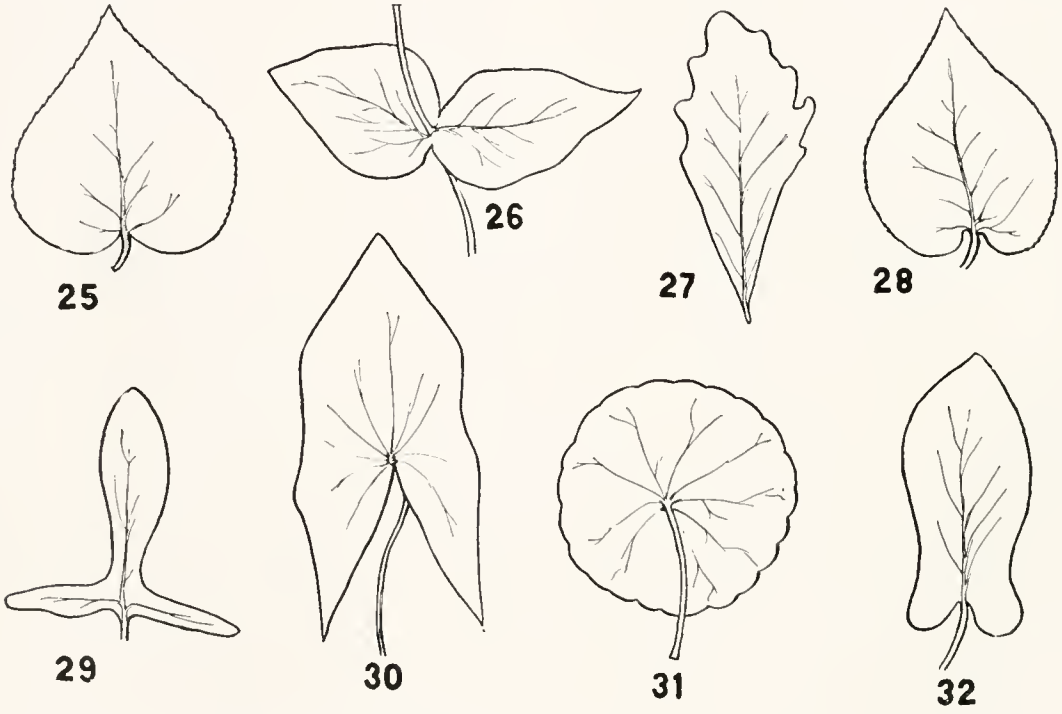


Mucronate; when the apex is terminated by a short blunt tip (figure 23).

Cuspidate; when the tip of the blade is hard and stiff (figure 24).

Terms applied to the base of the leaf:

The terms **truncate, acuminate, acute, obtuse** (defined above) may also be applied to the shape of the base of the leaf blade, in addition to the following:



Cordate; heart-shaped (figure 25).

Cuneate, or wedge-shaped; when the sides of the leaf blade taper to an acute angle at the base (figure 27).

Auriculate, when the depression at the base of the blade is deep and produces on either side conspicuous basal lobes (figures 28 and 32).

Sagittate; when the basal lobes point downward like the head of an arrow (figure 30).

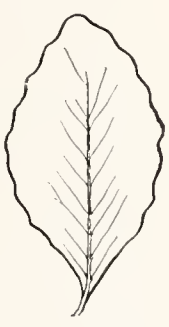
Hastate; when the basal lobes are turned outward (figure 29).

Peltate; a rounded leaf blade with the petiole attached at or near the middle of the lower surfaee (figure 31).

Perfoliate; when the bases of leaf blades meet and join around the stem of the plant (figure 26).

Terms applied to the marginal segmentation of leaf blades:

Sinuate; when the marginal lobes of the leaf blade present a wavy outline (figure 33).



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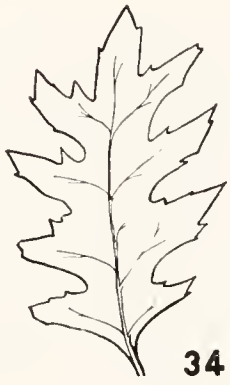

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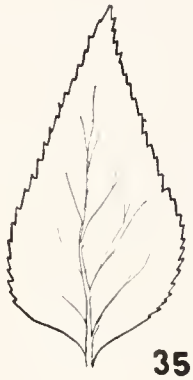

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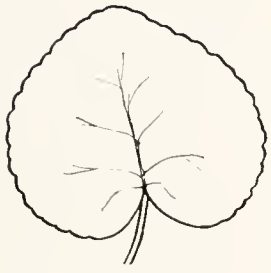

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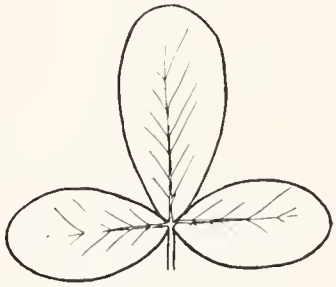

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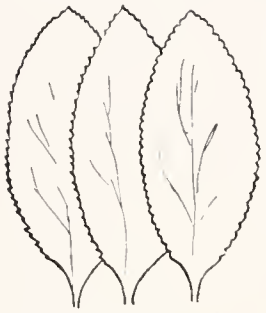
Pinnately lobed; when the tissue between the veinlets is eut out nearly to the midrib of the leaf and the divisions are arranged like the pinnae of a feather (figure 34).

Palmate; when the blade is deeply divided nearly or quite to a common base (figure 38).

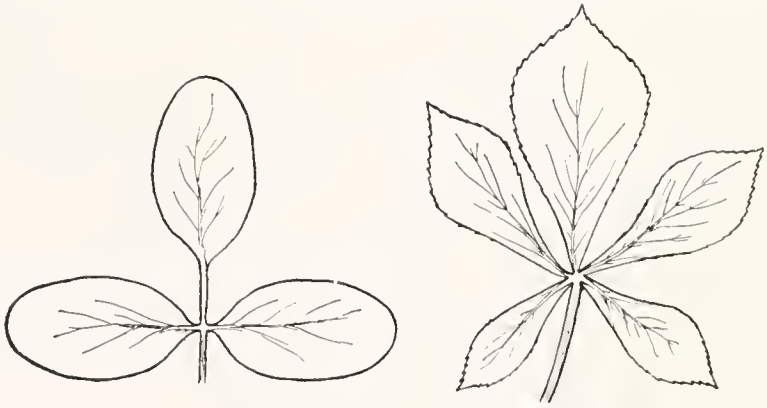
Serrate (figure 35); when the margin is sharply toothed with coarse teeth, like a saw. When the teeth are rounded inward or are convex, the margin is said to be **dentate** (figure 37). When the margin is formed of rounded teeth it is said to be **crenate** (figure 36). If the teeth are very small, the diminutives of the above terms are used, namely, **serrulate** (figure 39), **denticulate** (figure 40) and **crenulate** (figure 41).



39 40 41

Compound leaves:

When a leaf possesses several divisions or segments upon a common petiole or raehis, it is said to be compound. The distinction between a simple leaf, which is deeply divided, and a compound leaf, rests upon the presence of distinct articulation between the leaf segment of the compound leaf and the petiole. Compound leaves may be **pinnate** (figure 42), when the leaflets are arranged on either side of a common petiole (Ash, Rose, Walnut etc.) or **palmately compound** (figure 43), when the leaflets all join the petiole at its summit (Horse-chestnut).



42 43

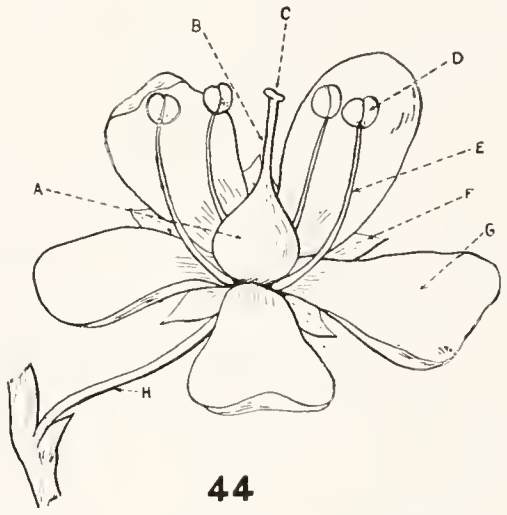
Leaf arrangement:

Alternate, when the leaves are arranged one at a node and each leaf is opposite and above the preceding leaf; **spirally arranged,** when the nodes

are not opposite; and **opposite** when the leaves are in pairs opposite each other on the same node. When several leaves are inserted on the same node they are said to be **whorled** or **verticillate.**

Flowers

The flower of a plant is a group of organs (figure 44) which exist for the purpose of producing seed. The parts of a flower fall into two general groups: those which actually function as seed producers (essential organs), and those which act as protective organs or organs for the attraction of insects (floral envelops or perianth). These might also be designated as non-essential organs, since they are lacking in certain flowers.



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The essential organs consist of two parts, the **pistils** (figure 44A) and the **stamens** (figure 44D, E), often designated as the pistillate and staminate parts of a flower; and when a flower contains only pistils it is called a **pistillate flower,** and when it contains only stamens it is called a **staminate flower.**

When both stamens and pistils are present in the same flower, it is said to be **perfect.** If, in addition, the flower possesses the floral envelops, calyx and corolla, it is called a **complete flower.** Hence a flower which lacks any of these sets of organs is **incomplete** (that is, if it lacks either calyx or corolla); if it lacks either stamens or pistils it is **imperfect.**

The perianth or floral envelopes:

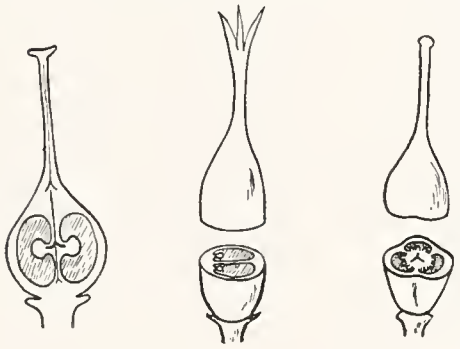
The ideal flower contains two sets of floral envelops, the **calyx** (figure 44F) and the **corolla.** In some flowers the corolla is entirely or partly divided into a certain number of divisions, each of which is called

a **petal** (figure 44G). They are usually but not always brightly colored. Subtending or beneath the corolla is the calyx, which is usually, but not always, green, and is likewise in many plants divided into a number of distinct parts or **sepals.** When an incomplete flower has but one set of floral envelopes, it is usually the petals (or corolla) which are lacking, and in such cases the calyx may be brightly colored and function as a corolla (a petaliferous calyx).

The essential organs:

The number and arrangement of stamens varies in different kinds of plants, but nearly always a stamen consists of a **filament** or **stalk** (figure 44E), which bears at its apex the **anther** (figure 44D), or pollen-bearing sac. The shape of the anther, and the manner by which it dehisces, or opens to emit the pollen, likewise varies in different groups of plants.

The **pistil** (figure 44A–C), or seed-bearing organ, consists of an **ovary** (figure 44A), **stigma** (figure 44C) and **style** (figure 44B). The **ovary** is at the base of the pistil and contains the **ovules** or **eggs,** which after fertilization ripen into **seeds.** The **ovary** usually contains several or many ovules, but may contain as few as a single ovule. The **stigma** is that part of the pistil which acts as a receptive organ for pollen in the process of pollination. Its surface is usually moist and minutely granular and its position and shape are dependent upon the mode of pollination (insects or wind) made use of by the particular plant. The **style** connects the stigma and ovary. It may be long or short, slender or stout, or sometimes entirely lacking when the stigma is situated directly upon the ovary.



45 **46** **47**

The ovary itself may contain one or several chambers or cells (figures 45–47), and very frequently the number of chambers in the ovary and the

lobes or divisions of the stigma bear a direct relationship to the number of petals, sepals and stamens. The term **carpel** (or **carpophyllum**) is used to designate the seed-bearing leaf. A **carpel** may be a pistil of itself, or it may be a constituent of a more complex pistil. In either case, a carpel is the homologue of a leaf. The surface within the ovary to which the ovules are attached is called the **placenta.**

Simple pistils may be solitary, or several together on a common receptacle within the flower, as in the Buttercup. A **compound pistil** consists of two, three or more carpels united into one body.

The apex of the flowering stem, which supports the flower, is designated as the **receptacle.**

48 49 50 51

Arrangement of flowers:

Flowers are either solitary or clustered, but their arrangement varies in different kinds of plants, and may even vary to some extent in the same species. The arrangement or disposition of the flowers may be designated as the **inflorescence.** The following are the most frequent arrangements of flowers:

Spike (figure 48), in which the flowers are arranged along the flowering

stem, and sessile (that is, without stalks) or with very short stalks (**pedicels**). When the flowering stem is naked (devoid of leaves) and rises directly from the root or crown of the plant, it is called a **scape** (figure 51).

Raceme (figure 49), in which the flowers are arranged along a flowering stem and each flower possesses a distinct stalk or pedicel. The lower pedicels may be somewhat longer than the upper ones.

Umbel (figure 52), when the flowers arise from the same point, which is usually the apex of the flowering stem or of a lateral flowering stalk, and

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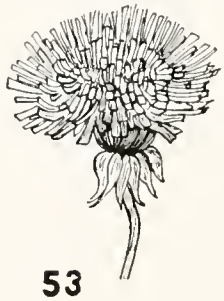

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radiate like the rays of an umbrella. If the radiating stalks of such an inflorescence bear smaller umbels at their tips, it is called a **compound umbel.**

Corymb [corymbose] (figure 54), when the branches of an inflorescence are of unequal length, but the lower or outer ones are longest so that they all form a flat-topped, or nearly flat-topped, cluster.

Cyme (figure 55), when the flowers each terminate an axis or stem arising successively from a new axis or stem.

A **spadix** is a spikelike infloreseenee with a fleshy stalk and with sessile flowers; the floral leaf or braet whieh subtends it or surrounds it partially is ealled the **spathe** (Skunk Cabbage, Wild Calla).

A **panicle,** or **compound raceme** (figure 50), is formed by the arrangement of flowers along the plant stem, similar to a raeeme, but eaeh flower stem has two or more braneh es.

Head (figure 53), an arrangement of flowers eompaetly on a common reeeptaele and surrounded by braets (**involucral bracts**).

Modification and arrangement of the perianth:

Among the simpler groups of flowering plants the perianth is wanting, as in the Cat-tail and Willow. In the Sweet Flag, Oak and others, the perianth eonsists of a few seales, but in the higher plants, the perianth appears as a eonspieuous portion of the flower, as in the Lily. Finally, as in the Rose family, there appears a elearly differentiated ealyx and eorolla.

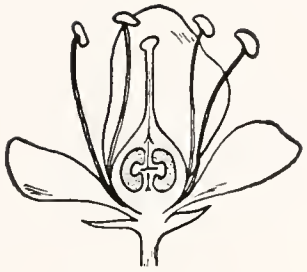
In the simpler types of flowers, the sepals, petals and the stamens arise at the top of the receptaele. Such flowers are ealled **hypogynous,** meaning the insertion of these parts below the ovary (figure 56).

When the basal portion of the reeeptaele is eontinued upward, forms a eup-shaped growth around the ovary and bears the sepals, petals and stamens upon its margin, the flower is ealled **perigynous** (figures 57 and 59), meaning the insertion of the parts of the flower around the ovary.

Frequently the growth of the reeeptaele adheres to the ovary, and the sepals, petals and stamens appear to arise from above the position of the ovary, in whieh ease the flower is ealled **epigynous** (figure 58), meaning above the ovary.

There may be varying degrees of eohesion or union of the parts of one or both of the floral envelopes (perianth). When the sepals are united with eaeh other the ealyx is said to be **gamosepalous,** while a **gamopetalous** eorolla (figures 62, 63, 64 and 65) refers to a union of the petals, as in the flower of the Morning-glory.

The degree of eoaleseenee or union of parts of a gamopetalous eorolla



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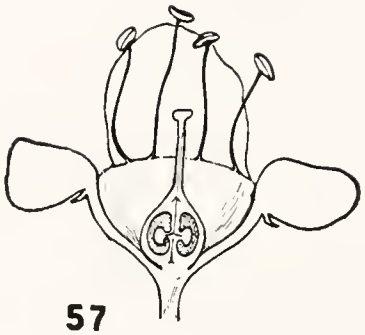

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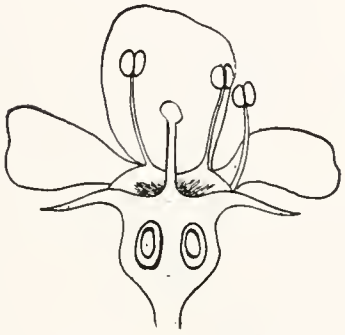

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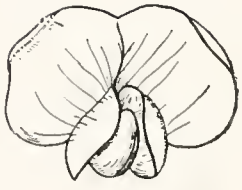

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varies in different flowers. When the calyx or corolla is divided almost to the base it is said to be **parted** (figure 63); when divided to about the middle it is said to be **cleft** (figure 64); when still less separated it may be said to be **lobed** or **toothed** (figure 65); or if entire on the margin it is said to be **entire** (figure 62).

When the parts of each set of organs of a flower are alike or equal in size, the flower is said to be **regular,** which means that the petals are alike, the sepals are alike and the stamens are alike. A **symmetrical** flower is one in which the sepals, petals and stamens are of the same number; **unsymmetrical** when there are unequal numbers in each **cycle,** that is, an unequal number of sepals, petals or stamens.

Certain groups of plants may often be recognized by the form of the corolla of some of its members. This character seems to be quite constant and the names of several large or important families of flowering plants are derived from this source. Of these groups we may mention the **cruciferous** (figure 60) type of flower of the Mustard family (Cruciferae), in which there are four spreading petals forming a cross, as in the flower of the Spring Cress (C a r d a m i n e b u l b o s a); the **labiate** corolla (figure 66) of the Mint family (Labiatae) in which the corolla is more or less two-lipped; the **papilionaceous** type of flower (figure 61) of the Pea family (Leguminosae), in which the petals are characteristically grouped into two lateral (wing) petals, a single upper (banner) petal and a pair of lower petals, often more or less united to form the **keel.**

Stamens:

The general characteristics of the stamens have already been described. In the stamens, as in the case of the petals and sepals, the number and arrangement are subject to great variation in different kinds of plants. **Monandrous** refers to a flower with a single or solitary stamen; **polyandrous** to a flower containing several stamens. The stamens may be **monodelphous,** in which the filaments are united into a tube, as in the Wild Lupine (figure 67), or the stamens may be **diadelphous** (figure 68), which means two sets

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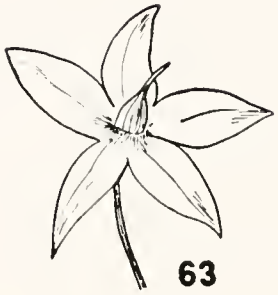

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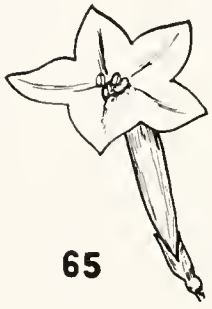

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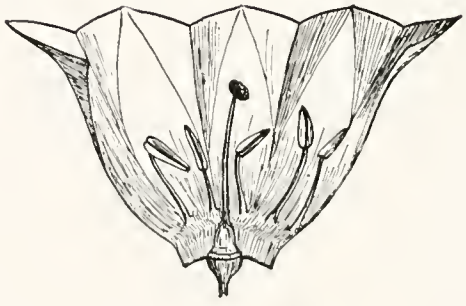

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of united stamens. In this form of arrangement there may be a union of the filaments of all the stamens except one, which is a common diadelphous arrangement of stamens in many of the species of the Bean family. When there are several sets of united stamens, the arrangement is said to be **polydelphous.**

Adnation or union of the stamens with other parts of the flower is of frequent occurrence, and the terms employed depend upon the degree of adnation, or the absence of it, namely, **hypogynous** (meaning beneath the pistil), applied to parts, including stamens, which are inserted or borne on the receptacle of the flower (figure 56). This is the absence of adnation and indicates an unmodified type. **Perigynous** (around the pistil) implies an adnation which carries up the apparent origin or place of insertion of the parts of the flower to some distance above or away from the receptacle and thus placing the insertion around instead of beneath the pistil (figure 57). **Epigynous** (on the pistil), where the adnation is complete to the very top of the ovary (figure 58).

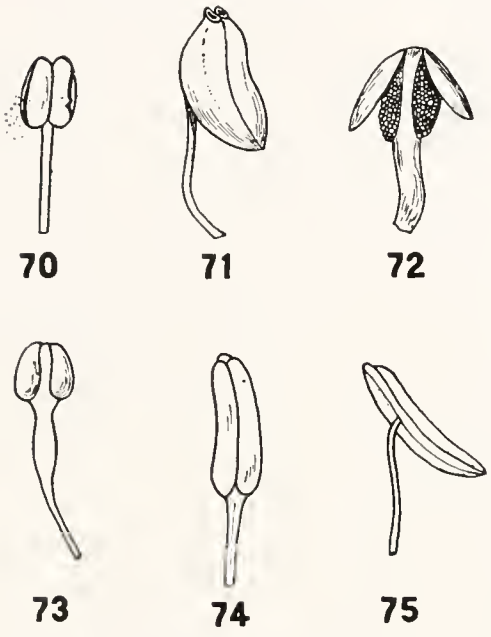
When the stamens are borne upon the corolla, or upon the tube of the corolla, they are said to be **epipetalous** (figure 69), and when they are borne upon the pistil, as in the Orchid family, they are said to be **gynandrous.**

The most important part of a stamen is the **anther** (figure 44D), which contains the pollen. It normally consists of two lobes or sacs; but as each sac is often, and in most of our common flowers, divided into two cavities, it appears to possess in such instances four pollen sacs. For the discharge of the pollen, the cells of a normal anther open along a definite line, usually extending from top to bottom. This suture or line of dehiscence may be lateral or marginal, or centrally located.

In the genus Solanum, to which the Potato belongs, in most members of the Heath family (Ericaceae), in Polygala, and certain other species, the anther cells open only by a hole or pore (figure 71). In the Blueberry, Cranberry etc. the pore-bearing tip of the anther cell is prolonged considerably, often into a slender tube. In the Barberry, and in most other members of that family, and in the Lauraceae, the whole face of each anther

cell separates by a continuous line, forming a kind of door, which is attached at the top, and turns back, as if on a hinge; and the anther is said to open by uplifted valves (figure 72). In the Sassafras and certain other members of the Lauraceae, each lobe of the anther opens by two smaller valves, like trapdoors.

The attachment of the anther to the filament (or stalk) presents three different modes, frequently connected by gradation: **Innate** (figure 70), in which the anther is a direct continuation of the axis of the filament, the cells usually opening by marginal slits, and the lobes or cells of the anther project neither inward nor outward; **adnate** (figure 73), in which the anther is a direct continuation of the filament but having the anther cells adherent to the anterior or posterior face of the filament; the Wild Ginger (Asarum) furnishes a good example of this, on account of a prominent prolongation of the connective or tip of the filament (figure 74); **versatile** (figure 75), when the anther is attached at some part only of its back or front to the tip of the filament, on which it lightly swings when the pollen is discharged; examples of this are seen in members of the Lily family, the grasses, Evening Primrose (Oenothera biennis) and others.



Pollination

The structure of most flowers affords an excellent indication of the device used for the transference of pollen from one flower to another (pollination). Long ago it was assumed that Nature wished no flower to be fertilized by its own pollen, but in the light of present knowledge we know

this is not wholly true. The subject of pollination of flowers by insects received a great light through the investigations of Charles Darwin and the publication in 1862 of his well-known book on the fertilization of orchids by the aid of insects.

As we understand the matter today, it appears that flowers are habitually intercrossed (flowers of the same species), and that there are manifold structural adaptations which secure or favor this interchange of pollen. Separation of sexes (stamens and pistils) is a direct adaptation to cross-pollination, rendering it necessary between individuals with dioecious flowers, and favoring it in most plants with monoecious and polygamous flowers. Strictly, close fertilization can take place in hermaphroditic flowers only.

Flowers depend upon certain external agencies for the transference of pollen from one flower to the flower on another plant. These agencies are wind (anemophilous flowers) and insects (entomophilous flowers). Other agencies are of minor importance, although water must be considered in connection with some aquatic plants.

Wind-pollinated flowers are mostly dull in color, destitute of odor and nectar, since these qualities attract insects. Wind-pollinated flowers usually have the sexes separated, the flowers borne in great abundance and have very light pollen. Most of our common trees (the Pines, Oaks, Hickories etc.) depend upon wind for the transference of pollen, as do also the grasses, sedges, Plantain and others.

Insect-pollinated flowers are correlated with showy coloration (including white, which is most showy at dusk), odor or secretion of nectar. Structural adaptations of the flower in reference to insect visitation are wonderfully various, and most of these are found upon investigation to favor, or often to necessitate, cross-pollination. The range of these variations is too extensive to be treated here. Literature upon this subject is easily available and most textbooks of botany contain chapters upon the subject.

After pollination the pollen grain germinates upon the surface of the

stigma, sends a tube down through the tissue of the stigma and style and discharges into the ovule a male nucleus which unites with a nucleus in the embryo sac of the ovule, fertilizing the ovule, and stimulating its development into an embryonic plant. By a process of hardening of the coats of the ovule its development is arrested and the seed is produced.

The Fruit

The fruit of a plant (in the case of our flowering plants) consists of the matured pistil (or gynoecium), including also whatever parts of the perianth or other floral organs may be joined to it. Fruits are of various degrees of simplicity or complexity, and may consist of a matured simple ovary, a cluster of such ovaries, at least when they are somewhat coherent, or a ripened ovary with calyx and other floral parts consolidated with it.

The **pericarp,** or seed vessel, is the ripened ovary and should therefore accord in structure with the ovary from which it is derived. In the development of a simple ovary into a simple fruit certain alterations sometimes take place, either by the abortion or obliteration of certain parts, or by accessory growth. The **dehiscence** is the method by which a pericarp opens to discharge its seeds and may be regular (normal) or irregular (abnormal). The word " pod " is frequently applied to dehiscent pericarps.

A **capsule** is a dehiscent pericarp formed of two or more carpels. Such carpels are **septicidal** (figure 80) when the dehiscence is such that the carpel is divided into its constituent carpels. Members of the St John's-wort family afford a good example of this method as do also Rhododendron and Kalmia. Carpels are called **loculicidal** (figure 79) when each of the component carpels splits down its dorsal suture, as in Iris, Hibiscus, Oenothera etc.

Kinds of fruits. For ordinary purposes it is sufficient to classify fruits into four classes:

1 Simple fruits, those which result from the ripening of a single pistil.

2 Aggregate, those of a cluster of carpels of one flower crowded into a mass.

3 Accessory fruits, where the principal mass consists of the surroundings or support of either a simple or an aggregate fruit.

4 Multiple or collective fruits, formed by the union or compact aggregation of the pistils of several flowers.

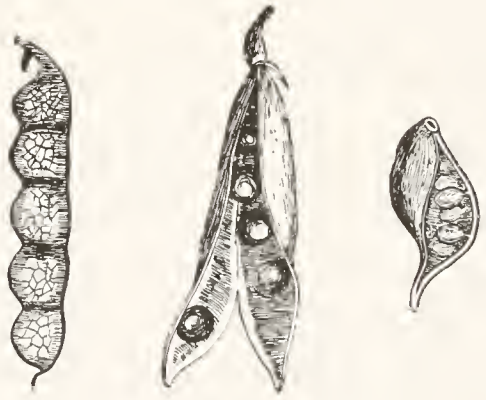
1 *Simple Fruits*

Upon the basis of texture, simple fruits may be designated as dry fruits, stone fruits and baccate fruits.

Dry fruits which are dehiscent:

Follicle (figure 78), a pod formed by a simple pistil, and dehiscent along one line (suture, and almost always the inner or ventral suture), as in the Columbine, Marsh Marigold, Milkweed and Dogbane.

Legume (figure 77), a pod formed of a simple pistil which is dehiscent by both sutures, so dividing it into two pieces or valves. The fruits of the Bean or Pea family are of this sort. Some members of this family (Meibomia), however, have legumes reduced to indehiscent achenes, joined together end to end, and to which a special term "**loment**" (figure 76) is applied.



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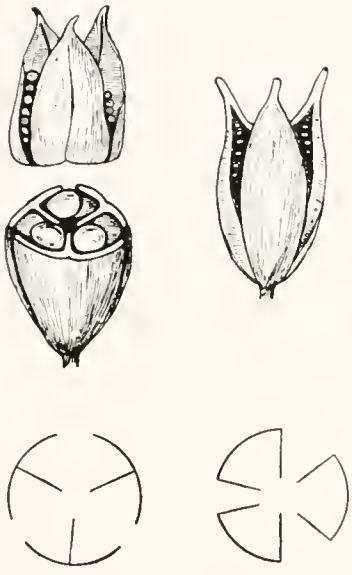
Capsule (figures 79 and 80), a pod or dehiscent fruit, of any compound pistil. The modes of regular dehiscence are mentioned above in the paragraph on dehiscence, and it remains here to describe two modifications of the capsule, namely, the **pyxis,** in which the dehiscence is along a circular line, cutting off the upper part as a lid, examples of which are seen in the common Plantain, Purslane and Henbane, small plants or weeds not illustrated in this work; and the **silique,** a narrow, two-valved capsule, with two parietal placentae, from which the

valves separate in dehiscence, as in the Mustard family, where there is usually a false partition stretched across between the two placentae.

Dry fruits which are indehiscent:



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Samara, an indehiscent, one-seeded fruit provided with a wing. In the Ash, the wing is terminal; in the Elm, the wing surrounds the body of the pericarp; and the Maple fruit is a double samara or pair of such fruits.

Achene (figures 81–88), a general term for all one-seeded, dry and hard, seedlike fruits. The best examples are the fruits of the Buttercup, Anemone, Clematis and Avens. The style sometimes remains on the fruit as a long and feathery tail (Dandelion, figure 85), and in others merely as a short hook (Buttercup, figures 86 and 87). In the Compositae (Sunflower family) the tube of the calyx is joined with the surface of the ovary, and its border or upper edge appears as a crown or cup, or a set of teeth or of scales, or very often as a tuft of bristles or hairs, called the **pappus** (figures 82–84, 88).

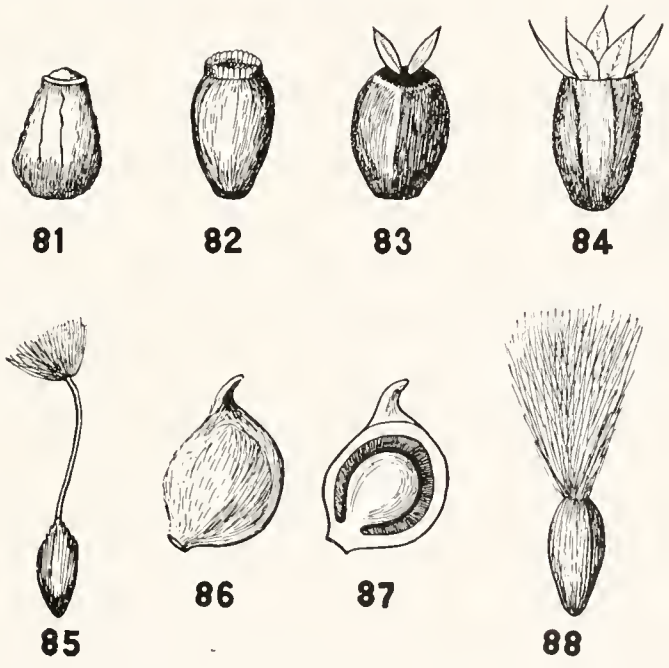
Utricle, a dry achenelike fruit with a thin and bladdery loose pericarp, like that of the Goosefoot (Chenopodium).

Caryopsis or **grain,** differs from the achene in having the seed completely filling the cell and its thin coats firmly consolidated throughout with the very thin pericarp. This term is applied to the fruits of the grass family, including Indian corn and all other cereals.

Nut, a hard one-celled and one-seeded, indehiscent fruit which finds its best examples in the fruit of the Hazel, Beech, Oak, Chestnut etc. The smaller nutlike fruits of the Borrage family and of the Mint family are usually called **nutlets.**

Stone fruits:

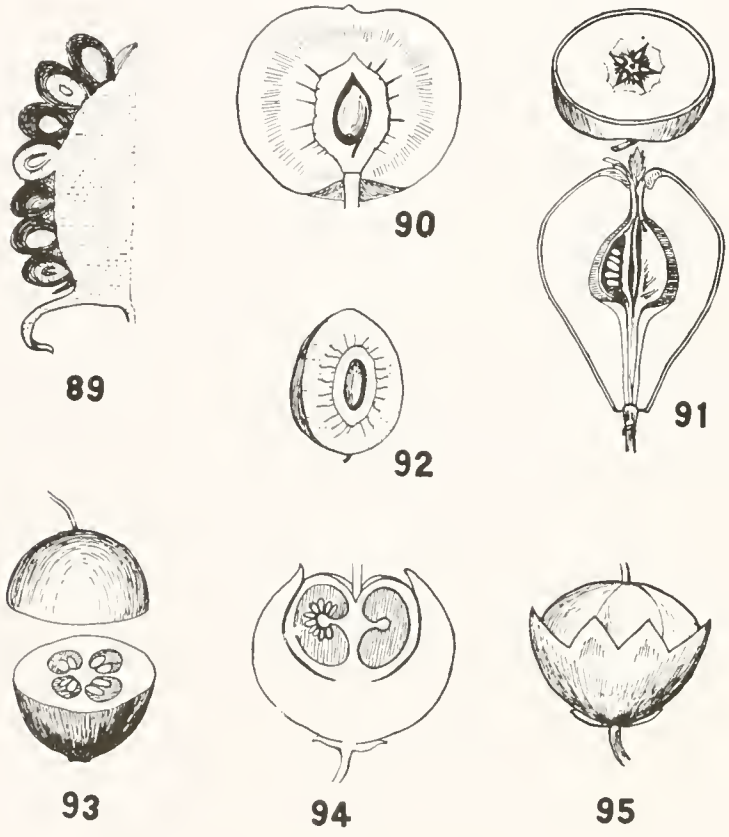
Drupe (figures 90 and 92), of which the best examples are the fruit of the Cherry, Plum, Peach etc., are one-seeded or rarely two-seeded, in the ripening of which the outer portion of the pericarp becomes fleshy or pulpy and the inner portion becomes much hardened. The term is also commonly applied to similar fruits of the Hackberry, Cornus, Rhamnus etc. In the case of the Blackberry (figure 89) and Raspberry, the several pericarps of the aggregate fruit are called **drupelets.**



Pome (figure 91), the name of the fruit of the Apple, Pear, Quince etc., which are fleshy fruits, composed of two to several carpels, of parchment-like texture (or hard in the Thorn Apples), inclosed in flesh which has developed from the inclosing calyx and receptacle. Indeed, the fruit of the Thorn Apple might well be called a " several-seeded drupe."

Pepo, or Gourd-fruit, a type of fruit typified by the Melon, Squash, Cucumber, Gourd and other members of that family.

Berry [baccate] (figure 93), a simple fruit in which the pericarp is fleshy throughout and without a hardened inner coat. The fruit of the Grape, Currant, Gooseberry, Cranberry, Banana and Tomato furnish good examples.



2 Aggregate Fruits

Aggregate fruits are those in which a cluster of carpels, all belonging to one flower, are crowded on the receptacle into one mass, as in the Blackberry (figure 89) taken as a whole. They may be aggregates of any kind of simple fruits. But when dry and not coherent, the mass would simply be described as a head or spike of carpels (or achenes, as in Buttercup, Anemone etc.).

3 *Accessory Fruits*

Accessory fruits are those in which some conspicuous part of the fruit is derived from some portion not organically connected with the ovary or pistil. This part might be called a pseudocarp, and this condition may occur either in simple, in aggregate, or in multiple fruits. The Wintergreen (Gaultheria procumbens) affords a good example (figures 94 and 95), the fleshy part of the fruit being the enlarged calyx. Likewise the torus, although not conspicuous, may be said to be an accessory part of the fruit of the Blackberry, being the fleshy or pulpy center of the fruit. In the Strawberry it is very conspicuous and comprises the sole edible part of the fruit, the achenes or true fruits being dispersed over the surface and comparatively insignificant.

4 *Multiple or Collective Fruits*

Multiple or collective fruits are those which result from the aggregation of several flowers into one mass. The simplest of these is the fruit of the Partridge Berry (Mitchella repens) and certain Honeysuckles (Lonicera) formed of the ovaries of two blossoms united into one fleshy fruit. More typical examples of this are seen in the Pineapple fruit, the Mulberry and others.

WILD FLOWERS OF NEW YORK

DESCRIPTIONS OF SPECIES

Cat-tail Family

Typhaceae

Broad-leaved Cat-tail

Typha latifolia Linnaeus

Figure 1

A marsh or aquatic plant, usually growing in thick colonies from creeping perennial rootstocks provided with fibrous roots. Stems stout, round in cross-section, glabrous, 4 to 8 feet high. Leaves numerous, linear, flat, swordlike, sheathing the stem at the base and rather stiffly ascending. Flowers monoecious, that is, staminate and pistillate flowers separate but on the same plant; densely crowded into terminal spikes; the staminate spikes uppermost and scarcely or but slightly separated from the dark brown or nearly black pistillate spike, each 3 to 12 inches long and often an inch or more thick. Perianth of the individual flowers composed merely of bristles which subtend two to seven stamens (in the staminate spike), or a small, short-stalked ovary (in the pistillate spikes). Mingled among the stamens and pistils are bristly hairs, and among the pistillate flowers many sterile flowers with clavate tips. The fruit consists of many small nutlets, surmounted by the persistent bristles which aid in wind dissemination of the seeds when the head of fruit breaks up.

Common everywhere in marshes and swamps, and also in Europe and Asia. Flowering in June and July; fruit ripe in August and September, frequently persistent until the following spring.

The Narrow-leaved Cat-tail (Typha angustifolia Linnaeus), is more abundant in marshes along the coast, but is sometimes found inland. The leaves are narrower than those of the preceding species, being one-sixth to one-half of an inch wide; spikes lighter brown in color, not so thick, and the staminate and pistillate spikes separated from one another.

Figure I
Broad-leaved Cat-tail
(Typha latifolia Linnaeus)

Water Plantain Family

Alismaceae

Broad-leaved Arrowhead

Sagittaria latifolia Willdenow

Plate 1

A perennial aquatic herb with thickened base and numerous long, fibrous roots. Leaves long petioled and extremely variable in form and size, sometimes wider than long and obtuse, sometimes linear-lanceolate and acuminate at the apex; the basal lobes of the leaf blades one-quarter to one-half as long as the blade. Flowers monoecious or sometimes dioecious, pediceled and borne near the summits of the scapes in verticels of three, the staminate usually uppermost, each verticel subtended by three bracts. Calyx of three persistent sepals. Stamens numerous; anthers two-celled, dehiscent by lateral slits. Pistillate flowers with numerous distinct ovaries and sometimes with imperfect stamens. The ovaries ripen into a globose or compact head of achenes, each achene broadly winged on both margins, with a beak about one-third its length and horizontal or nearly so.

Common in shallow water almost everywhere and offered by dealers in native plants for colonizing lily ponds and shallow waters. Such situations are scarcely complete without its presence. Flowering from July to September.

There are several closely related species such as Sagittaria cuneata Sheldon, with a minute beak to the achene, which is erect over the ventral wing; Sagittaria pubescens Muhlenberg, which is strongly pubescent; Sagittaria graminea Michaux, which has long-petioled, linear, lanceolate or elliptical leaf blades, acute at both ends, and much smaller flowers than S. latifolia, and other less abundant species. A nearly related genus is Alisma, represented in our range by the very common Alisma subcordatum Rafinesque (American Water Plantain), with oblong, elliptic, oval or ovate leaf blades which are cuneate, truncate or cordate at

the base, the flowering scapes rather tall, bearing numerous branches and pedicels in whorls of three to ten, with very small, white flowers. Like most other members of the Alismaceae, it inhabits shallow water or muddy places.

Sedge Family

Cyperaceae

Sheathed Cotton Grass or Hare's Tail Rush

Eriophorum callithrix Chamisso

Plate 2a

The Cotton Grass may be regarded not so much as a wild flower as one of the most ornamental of the sedges, since it is not a true grass. It is an inhabitant of cold, mossy bogs. The stiff culms, forming tussocks, rise eight to twenty inches above the surface of the bog and each culm bears at the summit a solitary spikelet of small, perfect flowers; each flower with six scalelike divisions, three stamens and a three-cleft style. Within the scalelike perianth are numerous soft, white bristles, which become greatly elongated in fruit, at which time the bog where the plant is growing becomes beautiful with hundreds or thousands of these waving white plumes.

Common in sphagnum bogs from Newfoundland to Alaska, south to Massachusetts, Pennsylvania and Wisconsin. Flowering in early spring, the white plumes being at their best in June or, in the far north, in July.

The Sheathed Cotton Grass is but one of a number of related species which add much to the beauty of our wet meadows, swamps and bogs in summer. Perhaps even more abundant in the north is the Thin-leaved Cotton Grass (Eriophorum viridiearinatum (Engelmann) Fernald) with five to thirty nodding white plumes, and the Virginia Cotton Grass (Eriophorum virginieum Linnaeus), in which the soft bristles of the mature plume are of a dingy brown color.

BROAD-LEAVED ARROWHEAD

Sagittaria latifolia

A. SHEATHED COTTON GRASS
Eriophorum callithrix

B. CAROLINA YELLOW-EYED GRASS
Xyris caroliniana

Arum Family

Araceae

Jack-in-the-pulpit; Indian Turnip

Arisaema triphyllum (Linnaeus) Torrey

Plate 3

A perennial herb, 1 to 3 feet tall, from a rounded, acrid corm. Leaves one or two, nearly erect, and exceeding the scape, three-foliate, the segments or leaflets pale green beneath, ovate, acute, rounded or pointed at the base, 3 to 8 inches long, 1 to 3 inches wide, unfolding with the flowers. Flowers dioecious, borne on the basal part of the club-shaped spadix, which is naked, blunt and green or purple above; spathe green and purple-striped, curving in a broad flap over the top of the spadix, long pointed, sometimes whitish with green stripes or almost uniformly greenish. The crowded ovaries of the pistillate flowers ripen into a cluster of bright-red, shining, globose berries.

A common plant of moist woods and thickets, flowering from early spring until June. The fruit ripens in July, and in late summer the leaves frequently wither and die, leaving the stalks of bright-red berries conspicuous objects in the woods.

Two closely related species are sometimes recognized, Arisaema pusillum (Peck) Nash, with leaves green beneath, a cylindrical spadix and spathe deep brown to almost black in color; Arisaema stewardsonii Britton, with a conspicuously fluted spathe which is whitish below and green or green-striped toward the tip, but otherwise resembling A. pusillum.

The Green Dragon or Dragon-root (Arisaema dracontium (Linnaeus) Schott) (figure 11) has solitary leaves divided into five to seventeen segments, and a narrow greenish or whitish, long-pointed spathe enwrapping the spadix, the upper part of which tapers into a slender appendage exserted 1 to 7 inches beyond the spathe. The mature berries are reddish-orange in color. This plant is less abundant than the Jack-in-the-pulpit, and much less conspicuous.

Figure II

Green Dragon or Dragon-root

(Arisaema dracontium (Linnaeus) Schott)

JACK-IN-THE-PULPIT; INDIAN TURNIP

Arisaema triphyllum

WILD CALLA; WATER ARUM
Calla palustris

Wild Calla; Water Arum

Calla palustris Linnaeus

Plate 4

A perennial herb of swamps and bogs with long, acrid rootstocks, covered with sheathing scales and with fibrous roots at the nodes, from which arise numerous petioled leaves with thick, entire, glossy green, broadly ovate or suborbicular leaf blades 2 to 5 inches wide, cuspidate or pointed at the apex and deeply cordate at the base. Flowering scapes about as long as the petioles, sheathed at the base, bearing at the summit an ovate-lanceolate or elliptic, acuminate, open spathe, white within and greenish without, sometimes with a second spathe nearly opposite the first and smaller in size, or rarely the two of equal size. Spadix cylindric, much shorter than the spathe, densely covered with perfect flowers, or the uppermost flowers staminate. The individual flowers on the spadix possess usually six stamens and no perianth. Ovaries ripening into a large head of red berries.

Frequent in swamps and bogs, especially northward. Rare in the southern part of the State. Flowering from late May to early July, the fruit ripening from June to August.

Skunk Cabbage

Spathyema foetida (Linnaeus) Rafinesque

Plate 5

A fetid herb, and the first plant to flower in the spring. The leaves are large, ovate, cordate, numerous in dense crowns, becoming in summer 1 to 3 feet long and 1 foot wide, but at flowering time scarcely beginning to unfold. Rootstock thick, descending, terminating in whorls of fleshy fibers. Spathe preceding the leaves, erect, 3 to 6 inches high, 1 to 3 inches in diameter, convolute, firm and fleshy, often one-fourth to one-half of an inch thick in the middle, pointed, completely inclosing the spadix, brown to greenish yellow, usually mottled, its short scape usually below the surface.

Spadix about 1 inch in diameter, entirely covered by the perfect flowers, greatly enlarged and sometimes 6 inches in diameter in fruit. The perianth of each flower consists of four hooded sepals.

A common plant of low, wet woods, meadows and swamps. When the spathes first appear, they possess little of the rank odor which characterizes them when older and which renders them objects of opprobrium. They appear almost before the last snowdrifts have disappeared and indicate the first awakening of plant life in spring.

The Arum family (Araceae), to which belong the Jack-in-the-pulpit, the Wild Calla, and the Skunk Cabbage, also contains several other native plants usually found in wet or damp places. The Green Water Arum (Peltandra virginica (Linnaeus) Kunth) with bright-green, hastate-sagittate leaves, often 1 to 2 feet long and 3 to 8 inches wide, possesses an inconspicuous green spathe, 4 to 8 inches long, with a strongly involute undulate margin. The Golden Club (Orontium aquaticum Linnaeus), found only in a few localities in the southern part of the State, possesses a cylindric, golden yellow spadix, from which the spathe falls at flowering time.

The Sweet Flag, Calamus or Flagroot (Acorus calamus Linnaeus) (figure III) belonging also to this family is a common plant of wet meadows, with long, linear, flaglike leaves and the spathe a leaflike extension of the scape, the spadix spikelike, 2 to 3 inches long and about one-half of an inch in diameter, compactly covered with minute greenish yellow flowers.

Yellow-eyed Grass Family

Xyridaceae

Carolina Yellow-eyed Grass

Xyris caroliniana Walter

Plate 2b

A small, tufted, grasslike plant of wet meadows and bogs, with numerous fibrous roots and flat, linear, grasslike leaves 4 to 15 inches long. Flowering scapes as long or usually much longer than the leaves. Sometimes over a foot tall, bearing at the summit a dense, ovoid, obtuse spike

SKUNK CABBAGE
Spathyema foetida

Figure III

Sweet Flag, Calamus or Flagroot

(Acorus calamus Linnaeus)

of coriaceous, overlapping bracts or scales. Flowers bright yellow, about one-fourth of an inch broad, on short, slender peduncles; each flower consisting of three oblong divisions to the corolla, three stamens inserted on the corolla and a three-branched style. Flowers appearing from the axils of the bracts comprising the spike.

In swamps, bogs and borders of streams from Maine to Florida and Louisiana, mostly near the coast. Flowering from June to August; in New York usually flowering in July.

Several closely related species are recognized by botanists. Xyris flexuosa Muhlenberg, of about the same range, has the scapes bulbous-thickened at the base. Xyris montana H. Ries, in bogs from Nova Scotia to Michigan and Pennsylvania, is frequent in the mountainous parts of New York, and resembles very closely the Carolina Yellow-eyed Grass.

Pipewort Family

Eriocaulaceae

Seven-angled Pipewort

Eriocaulon septangulare Withering

Plate 6a

A small, tufted plant with pellucid, fenestrate-nerved leaves arising from the crown, 1 to 3 inches long. Flowering scapes weak, twisted, usually about seven-angled, 1 to 8 inches tall, or when submersed, both the leaves and the scapes considerably elongated, bearing at the summit a small subglobose head of woolly white flowers, interspersed with numerous bracts; most of the flowers staminate and about one-eighth of an inch long, the few pistillate flowers scarcely more than half as large.

In still water and on shores of ponds, lakes and streams, usually where it is sandy, from Newfoundland to Minnesota, Florida and Texas. Usually in flower in this State in July and August. In the south are numerous other species of this and related genera.

A. SEVEN-ANGLED PIPEWORT
Eriocaulon septangulare

B. ASIATIC DAYFLOWER
Commelina communis

Spiderwort Family

Commelinaceae

Asiatic Dayflower

Commelina communis Linnaeus

Plate 6b

A glabrous plant with decumbent or ascending branching stems, often rooting at the nodes, 1 to 3 feet long with numerous oblong-lanceolate leaves 3 to 5 inches long and 1 to 1½ inches wide, acuminate at the tips and narrowed or rounded at the base, smooth and dark green, the stem with white-membranous, green-veined sheaths below each leaf. Flowers toward the ends of the branches or stems, each subtended by green leaflike spathes about 1 inch long, deep blue, one-half of an inch broad or broader, irregular, consisting of three sepals and three petals, two of them much larger than the third; three fertile stamens, one of them incurved and its anther larger than the others. In addition there are three sterile stamens. Fruit a small, two-celled capsule, each cell with two seeds; seeds compressed, dark brown and roughened.

A native of Asia, commonly naturalized or adventive in southern New York and southward, and occasionally appearing farther north. Sometimes called "Wandering Jew."

Spider Lily; Spiderwort

Tradescantia virginiana Linnaeus

Plate 7

A tall, smooth or slightly pubescent plant, belonging to the same family as the Dayflower, often 1 to 3 feet tall, with long, linear or linear-lanceolate, long-pointed leaves, often a foot long and one-half to 1 inch wide, usually more or less channeled along the middle. Flowers in terminal umbels or clusters on slender pedicels, one-half to 2 inches long; blue or purplish, rarely white, 1 to 2 inches broad with three small sepals, three large, obovate, similar petals, and six equal and fertile stamens.

In rich soil, mostly in woods and thickets, from southern New York, Ohio and South Dakota, south to Virginia and Arkansas. A common plant in cultivation farther north where it is a frequent escape to roadsides and fence rows. Although of great beauty, the flowers are of brief duration, and the delicate petals soon wither, the flowers being followed by others until all the numerous buds of each cluster have bloomed. With us it usually flowers in June and July or sometimes as late as August, especially since not all the stems appear to reach maturity at the same time.

Pickerel Weed Family

Pontederiaceae

Pickerel Weed

Pontederia cordata Linnaeus

Plate 8

A perennial aquatic herb, rising from a thick, horizontal rootstock, with thick, glossy, dark-green, ovate to lanceolate leaves, cordate-sagittate, truncate or narrowed at the base, 2 to 10 inches long, 1 to 6 inches wide, the apex and basal lobes obtuse. Flowering stems erect, 1 to 4 feet tall, glandular-pubescent above, one-leaved, with several sheathing, bractlike leaves at the base. Flowers blue, ephemeral, numerous, in a dense head or spike (spadix) subtended by a thin braetlike spathe. Each flower is tubular, about one-fourth of an inch long, curved, two-lipped, the upper lip composed of three ovate lobes, of which the middle one is the longest, and with two yellow spots at the base within, the lower lip of three linear-oblong spreading lobes. Stamens six, the filaments, anthers and style bright blue. After flowering, the lobes and upper part of the perianth tube wither above, while the persistent base hardens around the fruit.

Frequent along the borders of ponds and streams and shallow margins of lakes, where it flowers from June to September, usually at its best in August. One of the most attractive of our native aquatic plants.

The Pickerel Weed belongs to the Pontederiaceae, represented in our flora by but one other genus, the Mud Plantains (Heteranthera), with

SPIDER LILY; SPIDERWORT
Tradescantia virginiana

PICKEREL WEED
Pontederia cordata

two species of small, inconspicuous herbs of shallow water or wet muddy shores.

Bunchflower Family

Melanthaceae

Glutinous Triantha or False Asphodel

Triantha glutinosa (Michaux) Baker

Plate 9b

A perennial, herbaceous plant, somewhat bulbous at the base; stems 6 to 20 inches high, viscid pubescent with black glands, bearing a few leaves near the base; most of the leaves basal and tufted, linear and grasslike, 2 to 7 inches long. Flowers numerous in an oblong raceme at apex of the stem, subtended by minute involucral bracts, each flower about one-fourth of an inch broad, the perianth white, divided into six nearly equal oblong segments; stamens six, with pink or reddish anthers; fruit a small oblong capsule, the tiny seeds with a curved appendage at each end.

An inhabitant of sphagnum or marly bogs from Newfoundland to Minnesota, Michigan and the southern Alleghanies. By no means a common plant, and one which the wild flower connoisseur always likes to locate, and which repays by its rarity rather than its beauty the inevitable journey to the boggy place where it grows.

Glaucous Anticlea

Anticlea chlorantha (Richardson) Rydberg

Plate 9a

A slender, herbaceous, perennial plant from a membranous coated, ovoid bulb which is about an inch long. Stems slender, 6 inches to 3 feet tall; leaves linear, one-eighth to seven-eighths of an inch wide, keeled, the lower ones 4 to 12 inches long, the upper ones much shorter. Inflorescence a simple, open raceme or large, loose panicle, 4 to 12 inches long, with slender, ascending branches. Flowers perfect, greenish or yellowish, about three-fourths of an inch broad; perianth segments oval or obovate, obtuse, bearing a large obcordate gland just above the short claw, the

perianth persistent and adnate to the lower part of the ovary after withering. Fruit an oblong, three-celled capsule, about 1 inch long.

An inhabitant of marshes, bogs and moist places, New Brunswick to Vermont, New York, Manitoba and Missouri. Flowering in August. Not so rare as the Glutinous Triantha, but usually growing in similar locations.

Bunchflower

Melanthium virginicum Linnaeus

Plate 10

A rather tall, leafy, herbaceous plant, perennial by a thick rootstock; stems slender to somewhat stout, 2 to 5 feet high. Leaves linear, acuminate, often a foot long, but only one-third to 1 inch wide, the lower ones sheathing the stem, the upper ones smaller and sessile. Inflorescence a many-flowered panicle, 6 to 18 inches long, pubescent; flowers about three-fourths of an inch broad, greenish yellow, turning brown with age; perianth of six spreading, separate, persistent segments, each segment consisting of an oblong, obtuse, flat blade, sometimes obcordate, about twice as long as the claw, and bearing two dark glands at its base; stamens shorter than the segments and adnate to them; fruit a three-lobed capsule, about two-thirds of an inch long.

In meadows, wet woods and marshes, Rhode Island to southern New York and Minnesota, south to Florida and Texas. Flowering in July and August.

The Bunchflower is not a common plant in New York, and is found only in a few localities in the southern part of the State. Two closely related species are equally uncommon and also restricted to the southern part of the State. These are: (1) the Crisped or Broad-leaved Bunchflower (Melanthium latifolium Desvaux), with broader leaves and the blade of the perianth segments undulate, crisped and scarcely longer than the claw; (2) the Pine-barren Oceanorus (Oceanorus leimanthoides (A. Gray) Small), with linear, blunt leaves, the outer ones becoming fibrous, and small whitish flowers with oblong perianth segments, which are sessile.

A. GLAUCOUS ANTICLEA
Anticlea chlorantha

B. GLUTINOUS TRIANTHA; FALSE ASPHODEL
Triantha glutinosa

BUNCHFLOWER

Melanthium virginicum

American White Hellebore; Indian Poke

Veratrum viride Linnaeus

Plate 11

A tall, leafy, perennial herb; stem simple and branched only in the inflorescence, stout, 2 to 8 feet tall, from a poisonous, perennial, erect root-stock 2 to 4 inches long and 1 to 2 inches thick with numerous fleshy-fibrous roots. Leaves alternate, clasping, strongly veined and plaited, all pointed at the apex; the lower leaves broadly oval or elliptic, 5 to 12 inches long, 3 to 6 inches wide; the upper ones successively narrower and shorter, those of the inflorescence very small; stem and inflorescence pubescent. Flowers greenish or greenish yellow, two-thirds to 1 inch broad arranged in a many-flowered panicle at the summit of the stem, the panicle often 8 to 20 inches long, its lower branches spreading or drooping. Segments of the perianth six, without glands or claws, oblong or oblanceolate, ciliate-serrulate, twice as long as the curved, yellow stamens which are six in number and opposite the perianth segments. Fruit a three-lobed, three-celled, many-seeded capsule, three-fourths to 1 inch long and one-third to one-half of an inch thick.

In swamps and wet woods, New Brunswick, Quebec and Ontario to Minnesota, south to Georgia and Tennessee. Flowering in May and June, or July in the far north.

Lily Family

Liliaceae

Day Lily

Hemerocallis fulva Linnaeus

Plate 12

A tall, glabrous herb with fibrous roots, usually growing in dense clusters. Leaves mostly basal, linear, erect or spreading, 1 to 2 feet long and one-half to two-thirds of an inch wide, channeled and tapering to an acute tip. Flowering scapes leafless, 2 to 5 feet tall, bearing a few short bracts above, and six to fifteen flowers on short pedicels. Perianth

funnelform, tawny-orange, 4 to 5 inches long, opening for a day, its lobes oblong, somewhat spreading, netted-veined, the three outer nearly flat and more acute; the three inner ones undulate on their margins and blunt. Stamens six, inserted at the top of the perianth tube, shorter than the lobes of the perianth and declined. Fruit an oblong, thick-walled, three-angled, wrinkled capsule.

Native of Europe and Asia. Frequent in cultivation in this country and commonly escaped to meadows, along streams and roadsides or persistent in old yards and cemeteries. A flower of early introduction into the eastern states where it has made itself quite at home as an escape, and thrives and spreads with amazing rapidity under favorable conditions.

The Yellow Day Lily (H e m e r o c a l l i s f l a v a Linnaeus), with yellow flowers, their lobes parallel-veined, is occasionally found near old gardens and on roadsides, but not so frequently as the tawny-orange flowered Day Lily.

Red Lily; Wood Lily; Philadelphia Lily

Lilium philadelphicum Linnaeus

Plate 13

Stems 1 to 3 feet tall from a bulb about 1 inch in diameter and composed of numerous narrow, jointed, fleshy scales. Leaves lanceolate, acute at both ends, or the lower leaves sometimes obtuse, in whorls of three to eight on the stem, or a few of the upper leaves alternate, thin, with finely roughened margins. Flowers one to five at summit of stem, erect, 3 to 4 inches high; perianth reddish orange, its six equal segments spatulate, somewhat spreading, pointed or obtuse, one-half to 1 inch wide, gradually narrowed below, spotted with purple toward the base; stamens six, about as long as the club-shaped style. Capsule oblong-ovoid, 1 to 2 inches long.

In rather dry woods and thickets, more often in sandy regions than elsewhere, Maine and Ontario to North Carolina and West Virginia.

AMERICAN WHITE HELLEBORE; INDIAN POKE

Veratrum viride

DAY LILY

Hemerocallis fulva

RED, WOOD OR PHILADELPHIA LILY

Lilium philadelphicum

Wild Yellow Lily; Canada or Nodding Lily

Lilium canadense Linnaeus

Plate 14

Stems 2 to 5 feet tall, from a stout rootstock bearing several subglobose, scaly, white bulbs. Leaves in whorls of four to ten or some of them alternate, lanceolate or oblong-lanceolate, acuminate, 2 to 6 inches long, one-fourth to $1\frac{1}{4}$ inches wide, finely roughened on the margins and on the veins beneath. Flowers one to sixteen, nodding on long peduncles at the top of the stem; perianth segments 2 to 3 inches long, yellow or red, usually thickly spotted, recurved or spreading; fruit an oblong, erect capsule 1 to 2 inches long.

Common in swamps, moist meadows, and fields, Nova Scotia to Minnesota, Georgia, Alabama and Nebraska. Flowering in July and August. A common and most attractive wild flower of the east, more abundant than the Turk's-cap Lily (L i l i u m s u p e r b u m Linnaeus), which has similar but usually larger flowers, usually orange-red and purple-spotted, more strongly recurved flower segments and leaves smooth and not roughened on the margins or veins as in L. c a n a d e n s e.

Yellow Adder's-tongue; Dog's-tooth Violet

Erythronium americanum Ker

Plate 15a

A low, herbaceous plant arising from a deeply buried corm which propagates by offshoots; the simple stem 6 to 12 inches long, bearing a pair of equal or somewhat unequal, oblong or oblong-lanceolate, flat leaves, dark glossy green, usually mottled with brown, sometimes green all over, narrowed into clasping petioles; the flower stem arising from between the leaves, bearing a single nodding flower; perianth yellow or rarely purplish-tinged, the segments oblong, seven-eighths to 2 inches long, about one-fourth of an inch wide or less, recurved, dotted within, the three inner ones auricled at the base; style club-shaped; capsule obovoid.

In moist woods and thickets, Nova Scotia to Ontario and Minnesota south to Florida and Arkansas. Flowering in April and May.

One of the commonest and best known of our spring flowers, coming in company with the Hepatica, Spring Beauty, and Squirrel Corn, but usually in its prime a little later than these. The white Dog's-tooth Violet (Erythronium albidum Nuttall), with leaves less or not at all spotted and pinkish white flowers, is very rare.

Ague or Colicroot; Star Grass

Aletris farinosa Linnaeus

Plate 16

Leaves mostly basal, lanceolate and spreading, forming a dense cluster, lanceolate, long pointed, narrowed at the base, pale yellowish green, 2 to 7 inches long, one-fourth to 1 inch wide. Roots numerous, tough and very bitter. Stem or scape 1 to 3 feet tall, bearing a few distant bractlike leaves. The terminal raceme of flowers 4 to 12 inches long; flowers erect on short pedicels subtended by small bracts; perianth tubular-oblong, six-lobed, white or the short lobes yellowish, about one-fourth to one-third of an inch long and less than half as thick, mealy-roughened without; capsules ovoid, about one-sixth of an inch long, inclosed by the withering-persistent perianth.

In dry, mostly sandy soil, Maine to Ontario and Minnesota, south to Florida and Arkansas. Flowering in June and July. In New York rarely seen except in the sandy regions adjacent to the coast. Extremely abundant on sterile sandy fields like the Hempstead plains of Long Island, where it is very conspicuous in early summer. It possesses a number of vernacular names, such as Ague Grass, Blazing Star, Bitter Grass, Crow Corn, Mealy Starwort, Alocroot, Starroot, Huskroot, and others.

WILD YELLOW LILY; CANADA OR NODDING LILY

Lilium canadense

A. YELLOW ADDER'S-TONGUE; DOG'S-TOOTH VIOLET
Erythronium americanum

B. CLIMBING FALSE BUCKWHEAT
Bylderdykia scandens

AGUE OR COLICROOT; STAR GRASS

Aletris farinosa

Lily of the Valley Family

Convallariaceae

Yellow Clintonia; Dogberry

Clintonia borealis (Aiton) Rafinesque

Plate 17

Flowering scape or stem 6 to 15 inches high, with two to five (usually three), oval, oblong or obovate, thin, glossy green leaves at the base, their petioles sheathing the base of the stem which arises from a slender rootstock. Leaves ciliate, 5 to 8 inches long, and $1\frac{1}{2}$ to $3\frac{1}{2}$ inches wide. Flowers three to six, forming an umbel at the top of the stem, sometimes a secondary cluster of flowers below the top, drooping, greenish yellow, three-fourths to 1 inch long, on pedicels about as long as the flowers; perianth segments distinct, six in number, equal and somewhat spreading, the six stamens about as long as the perianth. Fruit an oval, dark blue, shining berry about one-fourth of an inch in diameter.

In moist woods and thickets, Newfoundland to Manitoba, south to North Carolina and Wisconsin. Very common in the rich, moist woodlands of northern New York, but rare or absent from the coastal region. Flowering from the latter part of May until the last of June. The fruit ripe in September.

The White Clintonia (Clintonia umbellulata (Michaux) Torrey), with smaller white flowers, not drooping, and black berries, leaves and scapes more pubescent but otherwise similar, which is common in the southern Appalachians, reaches New York in the southwestern counties of the State.

Wild or False Spikenard; False Solomon's-seal

Vagnera racemosa (Linnaeus) Morong

Plate 18

Stem slender or stout, erect or ascending, sometimes zigzag, 1 to 3 feet tall, simple, bearing numerous alternate, sessile or nearly sessile oblong-lanceolate or oval, acuminate leaves, 3 to 6 inches long, 1 to 3 inches wide,

which are finely pubescent, especially beneath, and sometimes also above, their margins minutely ciliate. Rootstock rather thick and fleshy with numerous long, fibrous roots, the scars of former stems irregular and ring-like. Flowers white; many, forming a large terminal panicle, 1 to 4 inches long; each flower about 2 lines broad; perianth of six oblong, equal, separate, spreading segments. Fruit a red, aromatic berry about 3 lines in diameter and speckled with purple. In Bergen swamp occurs a variety with three to six purple stripes like the fruit of V. s t e l l a t a.

In moist woods and thickets, Nova Scotia to British Columbia, south to Georgia, Missouri and Arizona.

The Star-flowered Solomon's-seal (V a g n e r a s t e l l a t a (Linnaeus) Morong) is scarcely less abundant, but seems to prefer thickets and banks with more moisture. The leaves are smaller and narrower, the flowers fewer in number, larger, white, and racemed; the berries green with six black stripes, or entirely black.

Three-leaved Solomon's-seal

Vagnera trifolia (Linnaeus) Morong

Plate 32a

Stem and leaves glabrous from a slender, elongated rootstock, the erect stem 2 to 15 inches high with two to four (usually three) oval, oblong or oblong-lanceolate, sessile leaves 2 to 5 inches long, one-half to 2 inches wide with sheathing bases. Flowers white, few, racemed at the top of the stem; perianth segments oblong or oblong-lanceolate, obtuse, finally somewhat reflexed and longer than the stamens. Fruit a dark-red berry about one-fourth of an inch in diameter.

In bogs and wet woods, Newfoundland to British Columbia, south to Connecticut, New Jersey, Pennsylvania and Michigan. Usually abundant in sphagnum under or near spruces and tamaracks, and therefore rare outside the mountainous sections of the State except on the margins of bogs and mossy swamps where the spruce and tamarack abound, as, for instance, Cicero swamp in Onondaga county, and Bergen swamp in Genesee county, as well as numerous other swamps of similar character throughout the State.

YELLOW CLINTONIA; DOGBERRY

Clintonia borealis

WILD OR FALSE SPIKENARD; FALSE SOLOMON'S-SEAL

Vagnera racemosa

False or Wild Lily of the Valley
Two-leaved Solomon's-seal

Unifolium canadense (Desfontaines) Greene

Plate 19

A low, herbaceous perennial with slender rootstock, and slender, erect and often zigzag stem, 2 to 7 inches high, bearing one to three (usually two) ovate or ovate-lanceolate, pointed leaves, cordate at the base and sessile or short-petioled; stemless plants frequent and consisting of a single leaf on a petiole 1 to 4 inches long arising from the rootstock. Flowers white, numerous, forming a rather dense terminal raceme, 1 to 2 inches long; perianth about one-fifth of an inch broad with four spreading, separate segments, which slightly exceed the four stamens in length; fruit a cluster of pale-red, speckled berries, each with one or two seeds.

In moist woods and thickets, Newfoundland to the Northwest Territory of Canada, south to the mountains of North Carolina, Tennessee, Iowa and South Dakota. Flowering in May and June.

A common wild flower of most parts of New York, especially in the moist cool forests of the northern and mountainous sections.

Sessile-leaved Bellwort

Uvularia sessilifolia Linnaeus

Plate 20a

Stems slender, glabrous, 4 to 12 inches high, naked or with one or two leaves below the fork. Leaves oblong or oblong-lanceolate, 1 to 3 inches long when they mature, thin, sessile, acute at each end, slightly rough-margined, pale or glaucous beneath; flowers greenish yellow, two-thirds to $1\frac{1}{4}$ inches long; the six perianth segments smooth, the stamens shorter than the styles; anthers blunt; fruit a sharply three-angled capsule, narrowed at both ends, about 1 inch long and two-thirds as thick.

In moist woods and thickets, usually most abundant where the soil is sandy, New Brunswick and Ontario to Minnesota, south to Georgia

and Arkansas. Except in the coastal region and other sections of the State with sandy soil, this small-flowered bellwort is not so abundant as U. grandiflora and U. perfoliata.

Large-flowered Bellwort

Uvularia grandiflora J. E. Smith

Plate 20b

An erect herb with smooth, leafy, forked stem from a perennial rootstock; stem with one or two leaves below the fork, 6 to 20 inches high. Leaves perfoliate, oblong, oval or ovate, pubescent beneath, glabrous above, becoming 2 to 5 inches long, acute at the apex, rather smaller and often scarcely unfolded at flowering time; flowers solitary at the ends of the branches, peduncled, drooping, narrowly bell-shaped, lemon-yellow, 1 to 1½ inches long, perianth segments six, distinct, smooth on both sides or very slightly granular within; stamens six, longer than the styles which are united to about the middle; anthers linear, the connective blunt; fruit a three-angled, truncate capsule, about one-half of an inch long.

In rich upland woods, Quebec to Ontario, Minnesota, Georgia and Kansas. Flowering in April and May. A common flower of most sections, especially in rich woodlands. In the Ontario lowlands and Hudson valley it is largely replaced by the Perfoliate Bellwort (Uvularia perfoliata Linnaeus), which differs chiefly in having smooth and glaucous foliage, and slightly smaller flowers with the perianth segments papillose within.

Sessile-leaved Twisted-stalk

Streptopus roseus Michaux

Figure IV

Stems 1 to 3 feet high from a short, stout rootstock covered with fibrous roots. Branches usually three or four in number and obliquely ascending, all leafy and sparingly pubescent. Leaves alternate, thin, many-nerved, ovate or ovate-lanceolate, 2 to 4½ inches long, long pointed at the apex, sessile, rounded or slightly clasping the stem at the base, green on both

FALSE OR WILD LILY OF THE VALLEY; TWO-LEAVED SOLOMON'S-SEAL

Unifolium canadense

A. SESSILE-LEAVED BELLWORT
Uvularia sessilifolia

B. LARGE-FLOWERED BELLWORT
Uvularia grandiflora

sides, but usually paler beneath, their margins finely ciliate. Flowers purple or rose colored, about one-third of an inch long, slender-peduncled, solitary or two together from the axil of each of the upper leaves on slender peduncles, one-half to 1 inch long, the peduncle bent or twisted at about the middle; perianth bell-shaped, its six segments lanceolate and pointed, their tips somewhat recurved or spreading. Stamens six, shorter than the perianth. Fruit a globose, red berry about one-third of an inch or less in diameter.

In moist woods, Newfoundland to Manitoba, Georgia and Michigan. Flowering in May and June.

The Clasping-leaved Twisted-stalk (Streptopus amplexifolius (Linnaeus) De Candolle) is similar but the leaves are clasping around the stem at their bases, glaucous or whitish beneath and the flowers are greenish white in color.

The Hairy Disporum (Disporum lanuginosum (Michaux) Nichols.) resembles the Twisted-stalks in manner of growth, but the leaves are somewhat narrower and not clasping and the flowers are solitary or few together at the ends of the branches, one-half to three-fourths of an inch long and greenish in color. It is found in woods in western New York.

Hairy Solomon's-seal

Polygonatum biflorum (Walter) Elliott

Plate 21

Stems slender, smooth, arching, often zigzag above from a thick, horizontal, jointed rootstock, bearing the raised orbicular scars of the stems of former years; stem naked below, above bearing six to many opposite or nearly opposite, oval or ovate leaves, 2 to 4 inches long, one-half to 2 inches wide, acute or acuminate at the apex, narrowed or obtuse at the base, pale or pubescent beneath, glabrous above, the upper leaves commonly narrower than the lower; flowers in drooping, axillary clusters of one to four (often two), perianth greenish or greenish yellow, tubular, one-third to one-half of an inch long, with six short lobes; the six stamens shorter than the tube, their anthers sagittate and filaments minutely roughened. Fruit a dark blue, pulpy berry about one-fourth of an inch in diameter.

Figure IV
Sessile-leaved Twisted-stalk
(Streptopus roseus Michaux)

HAIRY SOLOMON'S-SEAL
Polygonatum biflorum

A common but not showy plant of woods and thickets from New Brunswick to Ontario and Michigan, south to Florida and Tennessee.

Resembling this but usually larger in every way, with glabrous leaves and smooth filaments, is the Smooth or Giant Solomon's-seal (P o l y g o n a t u m c o m m u t a t u m (Roemer & Schultes) Dietrich), which ranges northeastward only to Rhode Island, New Hampshire and Ontario. It seems to prefer moist thickets and woods along streams and on bottomlands, while the Hairy Solomon's-seal is more commonly met with in rich upland woods.

Wake-robin Family

T r i l l i a c e a e

Indian Cucumber Root

Medeola virginiana Linnaeus

Plate 22

A slender, erect, unbranched herb from a perennial rootstock 1 to 3 inches long; stem 1 to $2\frac{1}{2}$ feet high, loosely covered with deciduous wool, bearing the lower whorl of leaves above the middle or, in flowerless plants, at the summit; leaves of the lower whorl sessile, 2 to 5 inches long, 1 to 2 inches wide; acuminate at the apex, narrowed at the base, three to five-nerved; leaves of the upper whorl 1 to 2 inches long, one-half to 1 inch wide, short petioled or sessile, often turning reddish at the base; umbel of two to nine flowers on filiform pedicels, 1 inch long or less, declined in flower, erect or ascending in fruit; perianth segments one-fourth to one-half of an inch long, obtuse, the six equal segments recurved, the three long styles recurved. Fruit a dark blue or purplish berry one-fourth to one-half of an inch in diameter.

In moist woods and thickets, Nova Scotia to Ontario, Minnesota, Florida and Tennessee. Flowering in May and June. Fruit ripe in September.

The thick, tuberlike, white rootstock is brittle with numerous slender fibrous roots and has the odor and taste of cucumbers.

Red Trillium; Wake-robin or Birthroot

Trillium erectum Linnaeus

Plate 23a

Stem rather stout, 8 to 16 inches high, from a thick, short rootstock. Leaves rather dark green, very broadly rhombic, 3 to 7 inches long, often as wide or wider, sessile or nearly so, acuminate at the apex, narrowed at the base, peduncle 1 to 4 inches long, erect or nearly so, bearing a single, unpleasantly scented, large flower; sepals lanceolate, acuminate, spreading, one-half to $1\frac{1}{2}$ inches long; petals lanceolate to ovate, acute, spreading, equalling the sepals or a little longer, dark purplish-red, varying to pink; greenish, white, or reddish yellow in certain aberrant forms; anthers longer than the filaments and exceeding the stigmas; ovary purple with short-spreading or recurved styles; fruit an ovoid, somewhat six-lobed, reddish berry, 1 inch thick or less.

In woods and thickets, Nova Scotia to Ontario, south to North Carolina and Tennessee.

White Trillium; Large-flowered Wake-robin

Trillium grandiflorum (Michaux) Salisbury

Plate 23b

A glabrous, erect, unbranched herb from a stout, perennial, short, scarred rootstock, 8 to 18 inches high; bearing at the top of the stem three light-green, broadly rhombic-ovate or rhombic-oval leaves, 2 to 6 inches long, acuminate at the apex, narrowed and sessile at the base, peduncle erect or nearly so, 1 to 3 inches long, bearing a single flower 2 to 3 inches broad. The three sepals lanceolate, pointed and spreading. Petals three, erect-spreading, oblanceolate, obovate, or rarely ovate-oblong, obtuse or cuspidate, thin, strongly veined, white, usually turning pink with age, much longer than the sepals. Stamens six, with yellow anthers which are

INDIAN CUCUMBER ROOT

Medeola virginiana

A. RED TRILLIUM; WAKE-ROBIN OR BIRTHROOT
Trillium erectum

B. WHITE TRILLIUM; LARGE-FLOWERED WAKE-ROBIN
Trillium grandiflorum

about one-half of an inch long; the three styles slender and ascending. Fruit a globose, black, slightly six-lobed berry, three-fourths to 1 inch in diameter.

In rich woods, preferring ravines and wooded upland slopes, Quebec to Ontario and Minnesota, south to North Carolina and Missouri.

Various monstrous forms sometimes occur with two to several long-petioled leaves, double flowers, and even forms with green, variegated or leaflike petals.

Painted Wake-robin

Trillium undulatum Willdenow

Plate 24a

Stem slender, 8 to 20 inches high, bearing three ovate, petioled, bluish green, waxy leaves, 3 to 8 inches long, 2 to 5 inches wide, long-acuminate at the apex, obtuse or rounded at the base. Flowers on erect or somewhat inclined peduncles, 1 to $2\frac{1}{2}$ inches long; sepals lanceolate, acuminate, three-fourths to $1\frac{1}{4}$ inches long, spreading; petals ovate or ovate-lanceolate, acuminate or acute, white and marked with magenta veins at the base, thin, and longer than the sepals, widely spreading, wavy-margined; the ovoid ovary with three slender spreading styles, ripening into an ovoid, obtuse, bluntly three-angled bright red shining berry.

Common in woods, especially low, moist or cool, sandy woodlands, Nova Scotia to Ontario and Wisconsin, south to Georgia and Missouri. Flowers in May and usually a few days later than the white or red trilliums.

Nodding Wake-robin

Trillium cernuum Linnaeus

Plate 24b

Stems rather slender, 8 to 20 inches high; leaves pale green, broadly rhombic, acuminate at the apex, narrowed at the base, sessile or with very short petioles, peduncle one-half to $1\frac{1}{2}$ inches long, recurved beneath the leaves and bearing a single drooping flower about 1 to $1\frac{1}{4}$ inches broad, sepals lanceolate or ovate-lanceolate, acuminate, petals white or pinkish,

ovate-lanceolate or oblong-lanceolate, rolled backward, wavy-margined, two-thirds to 1 inch long, as long or longer than the sepals; anthers about as long as the subulate filaments and overtopping the stout, recurved styles, ovary whitish, ripening into an ovoid reddish-purple berry.

In rich, usually low woodlands Newfoundland to Ontario and Manitoba, south to Georgia and Missouri. Flowering in May or in the extreme northern part of its range in June, usually about ten days later than the white or red trilliums.

Amaryllis Family

Amaryllidaceae

Yellow Star Grass

Hypoxis hirsuta (Linnaeus) Coville

Plate 25

A low, perennial herb with the leaves all basal, narrowly linear, one-eighth to one-fourth of an inch wide, more or less villous and mostly longer than the flowering stems, from an ovoid or globose corm, one-fourth to one-half of an inch in diameter; flowering stems erect, slender, villous above, usually glabrous below, 2 to 6 inches high, bearing at the summit an umbel of one to seven flowers; perianth six-parted, its segments narrowly oblong, spreading, equal or nearly so, obtuse, bright yellow within, greenish and villous without, one-fourth to one-half of an inch long; stamens somewhat unequal; the style rather shorter than the stamens and three-angled, the stigma decurrent on the angles; capsules in fruit about one-eighth of an inch in diameter, the black seeds angled.

In dry, especially sandy soil, in fields, thickets and open woods, Maine to Ontario, Assiniboia, Kansas, Florida and Texas. Flowering in May and June, but frequently putting up additional flowering scapes as late as August and September.

A. PAINTED WAKE-ROBIN
Trillium undulatum

B. NODDING WAKE-ROBIN
Trillium cernuum

YELLOW STAR GRASS

Hypoxis hirsuta

Iris Family

Iridaceae

Larger Blue Flag

Iris versicolor Linnaeus

Plate 26

Stems round and smooth, erect, sometimes flexuous, 2 to 3 feet tall, often branched above, leafy; leaves erect, shorter than and chiefly upon the lower part of the stem, somewhat glaucous, one-half to $1\frac{1}{4}$ inches wide; rootstock horizontal, thick, fleshy, covered with the fibrous roots. Flowers several, the perianth consisting of six, clawed segments united below into a tube, the three outer ones dilated, reflexed, violet-blue, variegated with yellow, green and white; crestless, spatulate, 2 to 3 inches long, and wider and longer than the three inner segments; the ovary below the perianth tube, in fruit becoming an oblong, obscurely three-lobed capsule, 1 to $1\frac{1}{2}$ inches long; divisions of the style petallike, arching over the stamens, bearing the stigmas immediately under their two-lobed tips.

In marshes, thickets and wet meadows, common along streams and ponds, Newfoundland to Manitoba, south to Florida and Arkansas.

Narrow Blue Flag; Poison Flagroot

Iris prismatica Pursh

Plate 27

More slender in every way than Iris versicolor Linnaeus, with a tuberous-thickened rootstock; stem 1 to 3 feet tall, bearing two or three very narrow, almost grasslike leaves usually less than one-fourth of an inch wide; flowers one or two at summit of each stem, blue, veined with yellow on slender pedicels; outer perianth segments one-half to 2 inches long, smooth and devoid of a crest, the inner segments smaller and narrower; the perianth tube about one-fourth of an inch long above the ovary. Fruit a narrowly oblong capsule, acute at each end and sharply three-angled, 1 to $1\frac{1}{2}$ inches long.

Marshes, wet meadows and swamps, mainly near the coast from Nova Scotia to Pennsylvania and Georgia. Flowering in May and June.

Pointed Blue-eyed Grass

Sisyrinchium angustifolium Miller

Plate 28a

Perennial and tufted, stems stiff and erect, pale green and glaucous, 4 to 18 inches high. Leaves pointed, about half as long as the stems, about one-sixth of an inch or less wide. Stem simple or rarely branched, winged, the edges minutely serrulate. Flowers deep violet-blue, one-half of an inch broad, umbellate from a pair of erect, green or slightly purplish bracts (spathe), the outer bract rather less than twice the length of the inner one, the six spreading segments of the perianth oblong and aristulate at the tip. Capsules subglobose, often purplish tinged, about one-fourth of an inch in diameter or less.

In fields and on hillsides, Newfoundland to Saskatchewan, British Columbia, Virginia, Nebraska, Colorado and Utah. Flowering from May to July.

There are four other species of blue-eyed grass in New York State: S. mucronatum Michaux, S. arenicola Bicknell, S. graminoides Bicknell and S. atlanticum Bicknell.

Orchid Family

Orchidaceae

The members of the Orchid family in New York State, of which several are described and illustrated here, constitute a very important number of our wild flowers and call for a description of the family. They are all perennial herbs with corms, bulbs or tuberous roots and entire, sheathing leaves, in some species reduced to scales. Flowers perfect, irregular, solitary, spiked or racemed. Perianth consisting of six segments, the three outer (sepals) similar or nearly so, two of the inner ones (petals) lateral, alike; the third inner one (lip) unlike the other two, often markedly

LARGER BLUE FLAG

Iris versicolor

NARROW BLUE FLAG; POISON FLAGROOT

Iris prismatica

A. POINTED BLUE-EYED GRASS
Sisyrinchium angustifolium

B. BASTARD TOADFLAX
Comandra umbellata

so, usually larger, often spurred. Stamens variously united with the style into an unsymmetrical column, usually one anther, sometimes two, each two-celled; the pollen in two to eight pear-shaped, usually stalked masses (pollinia), united by elastic threads, the masses waxy or powdery and attached at the base to a viscid disc (gland). Style often terminating in a beak (rostellum) at the base of the anther or between its sacs. Stigma a viscid surface, facing the lip beneath the rostellum, or the cavity between the anther sacs (clinandrium). Ovary inferior, usually long and sometimes twisted, three-angled, one-celled. Seeds very numerous and minute, usually spindle shaped.

Small White Lady's-slipper

Cypripedium candidum Willdenow

Plate 29

This is one of the rarer Lady's-slippers of the east, with rather stiffly erect stems 6 to 12 inches high. Leaves three to five, elliptic or lanceolate, pointed, 3 to 5 inches long, two-thirds to 1½ inches wide; flowers solitary or very rarely two on a stem; sepals lanceolate, as long or longer than the lip, greenish, spotted with purple; petals somewhat longer and narrower than the sepals, wavy-twisted, greenish; lip white, striped with purple or magenta inside, about three-fourths of an inch long.

In marly bogs and low meadows, sometimes in sphagnum bogs, New York and New Jersey to Kentucky, Minnesota, Missouri and Nebraska. Flowering in June and July.

Showy Lady's-slipper

Cypripedium reginae Walter

Plate 30

The largest and most showy of our native orchids, with a stout, villous-hirsute stem, 1 to 3 feet high, leafy to the top. Leaves large, 3 to 8 inches long, 1 to 4 inches wide, elliptic in shape, acute. Flowers 1 to 3; sepals round-ovate, white, the lateral ones united for their entire length; petals somewhat narrower than the sepals, white, lip much inflated, 1 to 2 inches long, white, variegated with crimson and white stripes.

In swamps and open wet woods, Newfoundland to Ontario, Minnesota and Georgia. Flowering in June and July, more rarely in August in the far north. Known also as Whip-poor-will's Shoe.

It is doubtful if any wild flower surpasses this in beauty. It has been gathered so extensively for its flowers in some localities that it has become rather rare. It is one of the plants that above all others needs protection in the way of education that will lead lovers of wild flowers to admire its beauty where it grows, and to use caution in picking.

Yellow or Downy Lady's-slipper

Cypripedium pubescens Willdenow

Plate 31

Stems tall and leafy, 1½ to 2½ feet high; leaves oval or elliptic 3 to 6 inches long, 1½ to 3 inches wide, pointed; sepals ovate-lanceolate, usually longer than the lip, yellowish or greenish yellow and striped with purple, petals narrower, usually twisted and elongated; lip much inflated, subglobose, 1 to 2 inches long, pale yellow to bright yellow and sometimes with purple lines, a tuft of white, jointed hairs inside at the top; sterile stamen triangular, the thick, somewhat triangular stigma incurved.

In rich woods and thickets, Nova Scotia to Ontario and Minnesota, Alabama and Nebraska. This species is usually regarded as a form of Cypripedium parviflorum Salisbury, which has a small, laterally compressed lip one-half to three-fourths of an inch long. Since numerous intermediate forms occur it is probable that they represent forms of a single variable species.

Ram's-head Lady's-slipper

Criosanthes arietina (R. Brown) House

(*Cypripedium arietinum* R. Brown)

Plate 32b and Figure V

Stems 6 to 12 inches high, with three or four elliptic or lanceolate leaves 2 to 4 inches long, one-third to 3 inches wide, one-flowered; sepals

SMALL WHITE LADY'S-SLIPPER
Cypripedium candidum

SHOWY LADY'S-SLIPPER
Cypripedium reginae

(Photograph by G. A. Bailey)

Figure V

Ram's-head Lady's-slipper

(Criosanthes arietina (R. Brown) House)

separate, lanceolate, one-half to seven-eighths of an inch long, longer than the lip; petals linear, greenish brown, about as long as the sepals; lip one-half to three-fourths of an inch long, red and white, veiny, prolonged at the apex into a long blunt spur, somewhat distorted at the upper end, which gives the plant its common name of Ram's-head Lady's-slipper.

A very rare species of cold and damp woods from Quebec to Manitoba, Massachusetts, New York and Minnesota. It has been collected but a few times in the northern counties of this State. The colored illustration is made from a photograph taken in southern Herkimer county by Mr Edward H. Eames of Buffalo and the accompanying halftone from a photograph by Mr G. A. Bailey of Geneseo.

Moccasin Flower; Stemless Lady's-slipper

Fissipes acaulis (Aiton) Small

(*Cypripedium acaule* Aiton)

Plate 33 and Figure VI

A short-stemmed plant with only two large, basal, elliptic leaves, 6 to 8 inches long and 2 to 3 inches wide, thick and dark green. The single fragrant flower borne on a scape 6 to 15 inches high; sepals greenish purple, spreading, $1\frac{1}{2}$ to 2 inches long, lanceolate, the two lateral ones united; petals narrower and somewhat longer than the sepals; lip a large, drooping, inflated sac with a closed fissure down its whole length in front, $1\frac{1}{2}$ to $2\frac{1}{4}$ inches long, somewhat obovoid, pink with darker veins, rarely white, the upper part of the interior surface of the lip crested with long, white hairs. Fruit an ascending capsule, pointed at each end.

In sandy or rocky woods, Newfoundland to Manitoba, south to North Carolina, Tennessee and Minnesota. One of the few conspicuous wild flowers that appears to be equally at home in the pine lands of the northern coastal plain and the rocky woods of the central and northern part of the State. On Long Island it sometimes blooms in May but in the north it usually blooms in June.

YELLOW OR DOWNY LADY'S-SLIPPER

Cypripedium pubescens

A. THREE-LEAVED SOLOMON'S-SEAL
Vagnera trifolia

(Photograph and Autochrome by Edward A. Eames)

B. RAM'S-HEAD LADY'S-SLIPPER
Criosanthes arietina

(Photograph by E. A. Eames)

Figure VI

Moccasin Flower; Stemless Lady's-slipper

(Fissipes acaulis (Aiton) Small)

(Photograph by O. O. Nylander)

Figure VII
Small Round-leaved Orchis
(Orchis rotundifolia Pursh)

Small Round-leaved Orchis

Orchis rotundifolia Pursh

Figure VII

Along with the Calypso, this small orchis shares the distinction of being the rarest wild flower of the State. Its slender stem rises to a height of 6 to 10 inches and bears near the base a single oval or orbicular leaf, 1 to 3 inches long, with one or two scales sheathing the stem below the leaf. Flowers in a short terminal spike, usually five to ten in number, each flower subtended by a small green bract. Sepals and petals oval, rose-colored, the lateral sepals spreading and usually slightly shorter, but sometimes longer than the petals; lip white, beautifully spotted with purple, longer than the petals, three-lobed, the middle lobe larger, dilated and two-lobed or notched at the apex; spur slender, shorter than the lip or barely equalling it in length.

In damp, mossy woods, Greenland to the Rocky mountains, Maine, New York and Wisconsin. The records of its occurrence in this State are very few. It has been found in Oneida, Herkimer and Lewis counties, but not in recent

MOCCASIN FLOWER; STEMLESS LADY'S-SLIPPER

Fissipes acaulis

SHOWY ORCHIS

Galeorchis spectabilis

years. Our illustration is from a photograph by Olaf O. Nylander, taken in Maine.

Showy Orchis

Galeorchis spectabilis (Linnaeus) Rydberg

(*Orchis spectabilis* Linnaeus)

Plate 34

Entire plant rather fleshy; stems short, five-angled, 4 to 12 inches high from a short rootstock provided with numerous fleshy roots. Leaves two, near the base of the stem, obovate, dark glossy green, 4 to 8 inches long and 2 to 4 inches wide, clammy to the touch; the three to ten flowers in a terminal spike, each flower about 1 inch long, violet-purple mixed with lighter purple and white, the subtending bracts sheathing the ovaries; sepals united above forming a hood; petals connivent under the sepals and more or less attached to them; lip whitish, wavy, produced into an obtuse spur, about as long as the petals; column short, scarcely extending above the base of the lip, violet on the back.

In rich woods, New Brunswick to Ontario, Dakota, Georgia, Kentucky, Missouri and Nebraska. Flowering in May and June or as late as July in the extreme northern part of its range.

Tall Leafy Green Orchis

Limnorchis hyperborea (Linnaeus) Rydberg

Plate 37a

A rather inconspicuous orchis with small flowers, the stem usually stout, 10 inches to 3 feet high. Leaves lanceolate, pointed, 3 to 10 inches long, one-half to $1\frac{3}{4}$ inches wide. Flowers numerous in a narrow terminal spike, small, greenish or greenish yellow; sepals and petals free and spreading, ovate, blunt; lip entire, lanceolate, blunt, about one-fourth of an inch long; spur about as long as the lip, blunt, slightly incurved or often thickened at the end (clavate).

In bogs, wet woods and swamps, Greenland to Alaska, New Jersey, Colorado and Oregon. Flowering in May and June or later in cold bogs and woods of the north.

The Tall White Bog Orchis (Limnorchis dilatata (Pursh) Rydberg) is usually more slender, with small white flowers; the ovate or lanceolate sepals nearly one-fourth of an inch long; petals lanceolate, pointed; lip entire, dilated or obtusely three-lobed at the base, blunt at the apex, about as long as the blunt and incurved spur. In similar situations, but southward only to Maine and New York.

Large Round-leaved Orchis

Lysias orbiculata (Pursh) Rydberg

Plate 35 and Figure VIII

Flowering scape rather stout, 1 to 2 feet high, with a few inconspicuous braets, and at the base, spreading flat on the ground, two large orbicular or orbicular-elliptical, dark-green, shining leaves, silvery beneath, 4 to 8 inches in diameter. Flowers forming a loose raceme, each flower on a pedicel about one-half of an inch long, erect in fruit, greenish white; upper sepal short and rounded; lateral sepals spreading, falcate-ovate and blunt; one-third to one-half of an inch long; petals smaller and narrower; lip entire, oblong-linear, blunt, white, about one-half of an inch long; spur longer than the ovary, about $1\frac{1}{2}$ to 2 inches long.

In rich woods, Newfoundland to Minnesota, south to Pennsylvania. Flowering in June and July.

Plate 35 shows the flowers after they have begun to fade. The detail of the flowers is shown better in figure VIII. Oakes Ames regards the loose-flowered form with long spurs as Habenaria macrophylla Goldie, and restricts Lysias orbieulata to the form with dense inflorescence and spurs 1 to $1\frac{1}{4}$ inches long.

Hooker's Orchis

Lysias hookeriana (A. Gray) Rydberg

Plate 36

Stem or flowering scape 8 to 15 inches high, stout, smooth, without bracts, but with two fleshy, shining, dark-green, oval-orbicular or obovate, spreading or ascending leaves at the base, 3 to 6 inches long, rarely flat on the ground. Flowers in a rather loose raceme, 4 to 8 inches long, yellowish

LARGE ROUND-LEAVED ORCHIS

Lysias orbiculata

HOOKER'S ORCHIS

Lysias hookeriana

Figure VIII

Flowers of Large Round-leaved Orchis (Lysias orbiculata (Pursh) Rydberg), left; and Large Coralroot (Corallorrhiza maculata Rafinesque) at right

green; each flower about two-thirds of an inch long; lateral sepals greenish, lanceolate and spreading, about one-third of an inch long; petals narrowly linear; lip linear-lanceolate, pointed, one-third to nearly one-half of an inch long; spur slender, pointed, two-thirds of an inch or more long, as long or longer than the ovary.

In cool, moist woods, Nova Scotia to Minnesota, south to New Jersey, Pennsylvania and Iowa. Flowering in June and July or later, in the north.

Yellow-fringed Orchis

Blephariglottis ciliaris (Linnaeus) Rydberg

Plate 37b

Stem slender, 1 to $2\frac{1}{2}$ feet high. Leaves lanceolate, pointed, 4 to 8 inches long, one-half to $1\frac{1}{2}$ inches wide, the upper ones much smaller. Flowers orange or yellow, large and showy in a terminal, many-flowered spike, 3 to 6 inches long; sepals orbicular or broadly ovate, oblique at the base, the lateral ones mostly reflexed; petals much smaller, oblong or cuneate, usually toothed; lip oblong, about one-half of an inch long, copiously fringed more than halfway to the middle; spur 1 to $1\frac{1}{2}$ inches long and very slender.

In meadows and open places in woods, especially in sandy regions, Vermont and Ontario to Michigan, Missouri, Florida and Texas. In New York State it is rare and local north of the coastal plain, occurring on the Schenectady plains and several other places, especially on the Ontario lowlands, from Rome west to Lake Erie.

White-fringed Orchis

Blephariglottis blephariglottis (Willdenow) Rydberg

Plate 38

A plant similar to the Yellow-fringed Orchis, but with a densely or rather dense, many-flowered spike of pure-white flowers, the petals toothed or somewhat fringed at the apex, rarely entire, the lip copiously or sparingly fringed.

A. TALL LEAFY GREEN ORCHIS
Limnorchis hyperborea

B. YELLOW-FRINGED ORCHIS
Blephariglottis ciliaris

WHITE-FRINGED ORCHIS

Blephariglottis blephariglottis

In bogs and swamps, Newfoundland to Minnesota, Florida and Mississippi. When growing with the Yellow-fringed Orchis, it blooms a few days earlier. It is found in nearly all the sphagnum bogs of northern New York and is not uncommon in moist depressions of the sandy coastal plain. Flowering from late June until early August in northern New York.

The Prairie White-fringed Orchis (Blephariglottis leucophaea (Nuttall) Farwell) has larger, white, fragrant flowers, sometimes tinged with green; the lip three-parted, the segments broadly wedge-shaped and copiously fringed. Most abundant westward but occurring eastward to New England.

Ragged or Green-fringed Orchis

Blephariglottis lacera (Michaux) Farwell

Plate 39b

Stems varying from slender and 1 foot or less high to stout and 2 to 3 feet high. Leaves firm, lanceolate, 3 to 8 inches long, two-thirds to $1\frac{3}{4}$ inches wide, decreasing in size upward. Flowers greenish yellow or greenish, in a loose spike, 2 to several inches long; petals linear, blunt, about as long as the sepals; lip three-parted, the segments narrow, deeply fringed or lacerate with a few threads about one-half of an inch long; spur one-half to three-fourths of an inch long, curved and thickened at the end, shorter than the ovary.

Common in swamps, low meadows and wet woods, Newfoundland to Minnesota, south to Georgia and Arkansas. Flowering in June and July. Forms frequently occur in which the fringe of the lip is very short.

Smaller Purple-fringed Orchis

Blephariglottis psycodes (Linnaeus) Rydberg

Plate 39a

Stem rather slender, 1 to 3 feet high. Leaves oval, elliptic or lanceolate, 3 to 10 inches long, two-thirds to 3 inches wide, becoming smaller above, dark green and glossy above. Flowers lilac-purple or rarely white, fragrant, in a dense, many-flowered terminal raceme, 2 to 8 inches long; petals oblong or oblanceolate, toothed on the upper margin; lip three-

parted, one-fourth to one-half of an inch broad, the segments fan-shaped and copiously fringed, the fringe of the middle segment shorter than that of the lateral ones; spur somewhat thickened at the tip, about three-fourths of an inch long, and longer than the ovary.

In meadows, swamps and wet woods, Newfoundland to Minnesota, North Carolina and Tennessee. Flowering in July and August.

The Large or Early Purple-fringed Orchis (Blephariglottis grandiflora (Bigelow) Rydberg) has a large, dense raceme of lilac or purplish, fragrant flowers, the lower lip, three-parted, the segments broadly fan-shaped and copiously fringed to about the middle. The flowers average one-third or one-half larger than those of B. psycodes; otherwise they are very similar and this may be only a large-flowered race of that species. Growing in similar situations.

Rose Pogonia; Snakemouth

Pogonia ophioglossoides (Linnaeus) Ker

Plate 40

A slender plant with fibrous roots and stems 8 to 15 inches high, propagating by runners. Leaves one to three on each stem, one-half to 4 inches long, lanceolate or ovate, erect, pointed or rather blunt. Flowers solitary or sometimes in pairs with leaflike bracts, fragrant, pale rose-colored, slightly nodding, 1 to 2 inches broad; sepals and petals similar, two-thirds to 1 inch long; lip spatulate, crested and fringed with white.

In swamps, low meadows and boggy depressions, especially in sandy regions, Newfoundland to Ontario, Florida, Kansas and Texas. Flowering in June and July, and in the north sometimes in flower as late as August.

Whorled Pogonia

Isotria verticillata (Willdenow) Rafinesque

Figure IX

Stems 10 to 15 inches high, from long, perennial, horizontal, fleshy rootstocks, which give rise to new stems by buds. Stems bearing a whorl of five leaves at the summit. Leaves obovate, abruptly pointed at the

Figure IX

Whorled Pogonia

(Isotria verticillata (Willdenow) Rafinesque)

apex, sessile, 1 to 4 inches long, usually only partially developed at flowering time. Flowers solitary, erect or declined, on a peduncle one-half to two-thirds of an inch long; sepals linear, dull reddish purple, spreading, $1\frac{1}{2}$ to 2 inches long and about one-twelfth of an inch wide; petals linear, erect, blunt, light green and arching above the lip, about five-sixths of an inch long; lip three-lobed at the end, middle lobe broadest, white and crenulate on the margin; two lateral lobes of the lip and the lateral margins tinged and veined with bright crimson-purple, most vivid at the apex of the two lateral lobes, crest of the lip green and papillose. Capsule erect, 1 to $1\frac{1}{2}$ inches long.

In moist soil of woods and thickets, often around cold sphagnum bogs, Ontario and Massachusetts to Michigan, Indiana and Florida. Flowering in May and June.

Arethusa; Dragon's-mouth; Wild Pink

Arethusa bulbosa Linnaeus

Plate 43b

A low, scapose, smooth plant, 5 to 10 inches high from a small bulb, stem bearing one to three loose sheathing bracts on the stem and a single linear leaf hidden at first in the upper bract and developing after the flower has faded. The single flower arising at the top of the stem from between a pair of small unequal scales, rose-purple, 1 to 2 inches high; sepals and petals similar, linear to elliptic in shape, obtuse, connivent, hooded, and arching over the column; lip usually drooping beneath the sepals and petals, the apex broad, variegated with purplish blotches and crested down the face with three hairy ridges, the margin fringed or toothed. Capsule about 1 inch long, ellipsoid, strongly six-ribbed.

In bogs, low meadows and mossy depressions or moist thickets, Newfoundland to Ontario and Minnesota, South Carolina and Indiana. Flowering in May and June. One of the most dainty and beautiful of our native orchids.

A. SMALLER PURPLE-FRINGED ORCHIS
Blephariglottis psycodes

B. RAGGED OR GREEN-FRINGED ORCHIS
Blephariglottis lacera

ROSE POGONIA; SNAKEMOUTH

Pogonia ophioglossoides

Grass Pink; Calopogon

Limodorum tuberosum Linnaeus

Plate 41a

Scape slender, 12 to 18 inches high from a round, solid bulb, arising from the bulb of the previous year, a single leaf appearing the first season, followed the next year by the flowering stem and a single linear-lanceolate leaf, 8 to 12 inches long, one-fourth to 1 inch wide. Flowers three to fifteen, forming a loose, terminal spike or raceme, each about 1 inch broad, purplish pink; sepals and petals nearly alike, separate, obliquely ovate-lanceolate, acute; lip broadly triangular and dilated at the apex, bearded along the face with yellow, orange and rose-colored hairs.

Common in bogs or boggy meadows. Newfoundland to Ontario and Minnesota, south to Florida and Missouri. Flowering in June and July.

Wide-leaved Ladies'-tresses

Ibidium plantagineum (Rafinesque) House

Plate 42a

A rather inconspicuous little orchid, 4 to 10 inches high with tuberous-fleshy roots. Leaves three to five to a stem, mostly near the base, lanceolate, 2 to 5 inches long. Flowers spreading in a dense, terminal spike, 1 to 2 inches long, one-third to one-half of an inch thick, each flower about one-fourth of an inch long; petals and sepals white, the lateral sepals free, narrowly lanceolate, the upper sepals somewhat united with the petals; lip pale yellow on the face, oblong, not contracted in the middle, the wavy apex rounded, crisped or fringed, the base short clawed, bearing mere traces of callosities at the base.

Moist banks, meadows and bogs, Nova Scotia to Minnesota, south to Virginia and Wisconsin. Flowers in June and July.

The most showy species of Ladies'-tresses is Ibidium cernuum (Linnaeus) House (figure X), which is 6 to 24 inches high and pubescent above. Leaves mainly toward the base of the stem, linear-lanceolate or linear, 3 to 14 inches long; flowers very fragrant, white or yellowish, forming

Figure X
Showy Ladies'-tresses
(Ibidium cernuum (Linnaeus) House)

a spike, 4 to 5 inches long and one-half to two-thirds of an inch thick; flowers spreading or nodding, each about five-twelfths of an inch long in three rows; lip oblong or ovate, rounded at the apex, crenulate or crisped on the margin. Flowering in late summer and autumn.

Another common species of Ladies'-tresses is Ibidium strictum (Rydberg) House, perhaps only a race of Ibidium romanzoffianum, which has the sepals and petals coherent and connivent into a hood. It is common in bogs and swamps during July and August.

Southern Twayblade

(*Ophrys australis* (Lindley) House)

(*Listera australis* Lindley)

Figure XI

The Twayblades are among the smallest of our native orchids and require sharp eyes to detect them among the recesses of the forest or bogs. The Southern Twayblade is about 5 to 10 inches tall, with two ovate, rather pointed, smooth and shining sessile leaves slightly above the middle of the stem

A. GRASS PINK; CALOPOGON
Limodorum tuberosum

B. LODDIGES'S RATTLESNAKE PLANTAIN
Peramium tesselatum

A. WIDE-LEAVED LADIES'-TRESSES
Ibidium plantagineum

B. FEN ORCHIS; LOESEL'S TWAYBLADE
Liparis loeselii

at the top of which is a loose raceme of six to fifteen small, yellowish green flowers; sepals and petals minute, the lip one-fourth to one-half of an inch long, and two-parted or split nearly to the base four to eight times as long as the tiny petals.

A rare plant of cold, sphagnous bogs in the northern counties, west to Wayne and Onondaga counties and south to Fulton county. In the Appalachian region south to Georgia, this is not a rare species.

Very similar to the Southern Twayblade is the Heart-leaved Twayblade (Ophrys cordata Linnaeus) in which the two sessile leaves are rounded or slightly heart-shaped, and the lip of the flower only two or three times as long as the petals. It is not rare in the Adirondack region but on account of its small size is easily overlooked. It has also been found in deep cedar swamps in certain other portions of the State.

(Photograph by E. A. Eames)

Figure XI

Southern Twayblade

(Ophrys australis (Lindley) House)

Downy Rattlesnake Plantain

Peramium pubescens (Willdenow) MacMillan

Figure XII

Flowering scape 6 to 20 inches high, densely glandular-pubescent,

Figure XII
Downy Rattlesnake Plantain
Peramium pubescens (Willdenow) (MacMillan)

bearing several lanceolate scales, from a branching, fleshy, perennial rootstock. Leaves all near the base of the scape, 1 to 3 inches long, two-thirds to 1 inch wide, pointed at the apex, rather abruptly contracted into short petioles, oval or ovate in shape, rather strongly reticulated with white along the principal veins on the upper surface, pale green beneath. Flowers white or tinged with green, forming a rather dense terminal spike which is not one-sided; each flower about one-fourth of an inch long or slightly less; lateral sepals ovate; upper sepals united with the petals to form an ovate hood (galea); lip saccate with a short broad blunt recurved or spreading tip.

In dry woods, Maine to Ontario and Minnesota, south to Florida and Tennessee. Flowering in July and August.

The Lesser Rattlesnake Plantain (Peramium ophioides (Fernald) Rydberg) is only about 6 to 10 inches high, with smaller, ovate, white-blotched leaves and small, greenish white flowers, one-eighth to one-sixth of an inch long in a one-sided spike. Frequent in woods.

Loddiges's Rattlesnake Plantain

Peramium tesselatum (Loddiges) Heller

Plate 41b

Leaves oblong-ovate or ovate-lanceolate, 1 to 2 inches long, one-third to one-fourth of an inch wide, bright green, abruptly narrowed into the petioles which sheathe the base of the stem, more or less marked on the upper surface with white; stem 6 to 14 inches high, glandular-pubescent and scaly, bearing at the summit a loosely spiral spike of flowers 1 to 5 inches long; flowers whitish, lateral sepals free, the upper ones united with the petals to form a hood (galea), 2 to 3 lines long, broad and recurved at the tip; lip roundish-ovate, slightly saccate at the base, the long tip somewhat recurved.

In coniferous woods, more rarely in open places, Newfoundland to Ontario, Pennsylvania and Michigan. Flowering from July to September.

White Adder's-mouth

Malaxis monophylla (Linnaeus) Swartz

Figure XIII

Stem very slender, 4 to 8 inches high, smooth, bearing below the middle a single leaf which sheathes the stem,

Figure XIII
White Adder's-mouth
(Malaxis monophylla (Linnaeus) (Swartz)

the blade 1 to 3 inches long, one-half to $1\frac{3}{4}$ inches wide. Flowers whitish, very small, in a slender raceme, 1 to 4 inches long; each flower about one-half of an inch long on a very short, nearly erect pedicel; lip triangular or ovate and long pointed.

In woods, thickets and recent clearings, Quebec to Manitoba, south to Pennsylvania and Nebraska. Flowering in July.

The Green Adder's-mouth (M a l a x i s u n i f o l i a Michaux) has the single leaf clasping the stem near the middle; flowers greenish on slender pedicels; lip broad and three-toothed at the apex. Small and inconspicuous as well as rather rare.

Large Twayblade

Liparis liliifolia (Linnaeus) L. C. Richard

Figure XIV

Scapes 4 to 10 inches high, striate and smooth from a perennial solid bulb, the base of the stem sheathed by several scales and two ovate or oval, blunt, shining, light-green leaves, 2 to 5 inches long, 1 to $2\frac{1}{2}$ inches wide. Flowers yellow, numerous, rather showy, forming a loose terminal raceme; petals very narrow and threadlike; lip erect, large, fully one-half inch long, wedge-obovate in shape. Capsule club-shaped and about one-half inch long.

In moist woods, thickets and recent clearings, Maine to Minnesota, south to Georgia and Missouri. Flowering from latter part of May to July.

Fen Orchis; Loesel's Twayblade

Liparis loeselii (Linnaeus) L. C. Richard

Plate 42b

A low bog orchis with two light-green, shining, elliptic or elliptic-lanceolate leaves, 2 to 6 inches long, one-half to 2 inches wide and obtuse, arising with the short stem from a solitary bulb which, with the base of the stem, is sheathed by several scales and the remains of leaves of former seasons; flowers greenish yellow, about one-fourth of an inch long, in a

(Autochrome by Edward A. Eames)

A. CALYPSO
Cytherea bulbosa

B. ARETHUSA; DRAGON'S-MOUTH; WILD PINK
Arethusa bulbosa

Figure XIV

Large Twayblade

(Liparis liliifolia (Linnaeus) L. C. Richard)

terminal, loosely flowered raceme; petals linear, somewhat reflexed; lip obovate, pointed, a little shorter than the petals and sepals, its tip incurved; capsules about one-half of an inch long, wing-angled.

In wet thickets, springy banks, and bogs or boggy meadows, Nova Scotia to Saskatchewan, south to Alabama and Missouri. Flowering from late May to July and sometimes later.

Calypso

Cytherea bulbosa (Linnaeus) House

(*Calypso borealis* Salisbury)

Plate 43a

Stem or scape 3 to 7 inches high from a perennial bulb one-half of an inch or less thick with coralloid roots. The scape bears two or three loose sheathing scales and at the base a single round-ovate leaf, 1 to 2 inches long, blunt or pointed at the apex and rounded or heart-shaped at the base, the petiole 1 to 2 inches long. Flower showy, solitary, 1 to $1\frac{1}{2}$ inches broad, at the summit of the scape, variegated with purple, pink and yellow; petals and sepals similar, nearly equal, linear, erect or spreading, each with three longitudinal purple lines. Lip saccate, large, two-divided below, spreading or drooping, with a patch of yellow woolly hairs. Column erect, broadly ovate and petallike, shorter than the petals, bearing the lidlike anther just below the summit.

In bogs and cold Arbor Vitae swamps, Labrador to Alaska, south to Maine, New York, Michigan, California and in the Rocky mountains to Arizona and New Mexico. Also in Europe.

One of the rarest and at the same time most beautiful of our native Orchids, appearing much like a small Cypripedium (Lady's-slipper). In New York it has been found in several localities in southern Herkimer, in Lewis, Oswego and Onondaga counties. The writer found it several years ago in Lodi or Tamarack swamp near Syracuse, but the place has since been obliterated by the growth of the city. For the illustration used here we are indebted to Edward A. Eames of Buffalo.

Large Coralroot

Corallorrhiza maculata Rafinesque

Figure VIII, page 73

Stems stout or slender, 8 to 20 inches high, with a large mass of coral-like branching rootstocks, the stem purplish, clothed with several appressed scales, devoid of green leaves or green color. Flowers ten to thirty, forming a terminal raceme 2 to 8 inches long, purplish brown; sepals and petals linear-lanceolate, about one-fourth of an inch long; lip white, spotted and lined with crimson, oval or ovate in outline, deeply three-lobed, crenulate; spur yellowish. Fruiting capsules ovoid or oblong, one-half to two-thirds of an inch long and drooping.

In woods, Nova Scotia to British Columbia, south to Florida, Missouri, New Mexico and California. Flowering from July to September.

The Early Coralroot (Corallorrhiza corallorrhiza (Linnaeus) Karsten) blooms in May and June. It has smaller flowers of a dull-purple color; sepals and petals about one-fourth of an inch long and a whitish, oblong lip; spur reduced to a small protuberance adnate to the summit of the ovary. Common in moist woods.

The Small or Late Coralroot (Corallorrhiza odontorhiza (Willdenow) Nuttall) blooms from July to September. It is 6 to 15 inches high and very slender. Flowers purplish; sepals and petals about one-sixth of an inch long or less, marked with purple lines; lip entire or denticulate, whitish, spotted with purple. A rather rare plant of moist woods. All the species of Coralroot are devoid of green leaves or green coloring matter in the stems, because of their parasitic or saprophytic habit.

Lizard's-tail Family

Saururaceae

Lizard's-tail

Saururus cernuus Linnaeus

Plate 44

Stem 2 to 5 feet high from a slender rootstock, jointed, pubescent when young, becoming smooth. Leaves ovate, thin, palmately five to nine-ribbed, dark green, entire, deeply cordate at the base, acuminate, 3 to 6

inches long, 2 to $3\frac{1}{2}$ inches wide; petioles sheathing the stem at the enlarged nodes; the stem terminating in one or two elongated white spikes, their tips drooping in flower. Flowers fragrant, small, white, without any perianth; stamens six to eight, white, spreading; ovary consisting of three or four carpels united at the base, becoming slightly fleshy and strongly wrinkled in fruit.

In swamps and shallow water, Rhode Island to Florida west to southern Ontario, Minnesota and Texas. Flowering from June to August.

Nettle Family

Urticaceae

False Nettle

Boehmeria cylindrica (Linnaeus) Swartz

Plate 45

A perennial, rough-pubescent or nearly smooth, erect plant, 1 to 3 feet tall, not provided with stinging hairs as are the true nettles. Leaves mostly opposite, thin, petioled, ovate to ovate-lanceolate, coarsely toothed, 1 to 4 inches long, one-half to $1\frac{1}{2}$ inches wide. Flowers greenish, small and dioecious, that is, some of the axillary spikes containing only staminate flowers, and others only pistillate flowers, or some of the spikes containing both kinds of flowers (androgynous); the staminate spikes interrupted, the pistillate mostly continuous, one-fourth to $1\frac{1}{2}$ inches long, often terminated by small leaves.

In moist soil and thickets, Quebec and Ontario to Minnesota, Florida, Texas and the West Indies. Flowering from July to September. Not an attractive plant but figured here as a representative of the Nettle family, none of our species having conspicuous flowers. The True or Stinging Nettle (Urtica dioica Linnaeus), naturalized in the eastern states from Europe, the Slender Wild Nettle (Urtica gracilis Aiton) and the Wood Nettle (Urticastrum divaricatum (Linnaeus) Kuntze) are all provided with stinging hairs and are most unpleasant plants to encounter unexpectedly in the woods.

LIZARD'S-TAIL

Saururus cernuus

FALSE NETTLE

Boehmeria cylindrica

Sandalwood Family

Santalaceae

Bastard Toadflax

Comandra umbellata (Linnaeus) Nuttall

Plate 28b

Stems numerous from a horizontal, branching rootstock, said to be parasitic on the roots of adjacent herbs, 6 to 18 inches tall, usually branched and very leafy. Leaves oblong or oblong-lanceolate, pale green, pointed at each end, sessile, one-half to 1½ inches long, the lower ones smaller. Flowers numerous in terminal cymes, corymbose at the summit of the stem, or also axillary, their branches divergent or ascending, greenish white, white, or purplish, about one-fifth of an inch long, calyx usually five-lobed, corolla none. Fruit a globose drupe about one-fourth of an inch in diameter, crowned by the upper part of the calyx tube and its five oblong lobes.

In dry fields and thickets, especially sandy soil, Cape Breton Island to Ontario and Assiniboia, south to Georgia, Kansas and Arkansas. At Bergen swamp in Genesee county, New York, it grows in an open marl bog, which, however, is dry in certain seasons, in company with Arethusa bulbosa, Cypripedium candidum, Scirpus caespitosus, Anticlea chlorantha, Triantha glutinosa, Solidago houghtonii, and other bog plants, a habitat most unusual for this species.

Birthwort Family

Aristolochiaceae

Wild or Indian Ginger

Asarum canadense Linnaeus

Plate 46

Leaves clustered in pairs from a slender, branching, aromatic rootstock, having the flavor of ginger. Leaf blades long petioled, reniform, thin, short pointed at the apex, 3 to 7 inches broad, dark green, the base

deeply cordate. Entire plant densely and finely pubescent. Flowers on a short, slender peduncle from between the bases of the petioles, often concealed or partly buried in old leaves on the ground, 1 inch or more broad, brownish purple; calyx ovoid, its tube completely adnate to the ovary, its three lobes inflexed in bud, ovate-lanceolate, acute or long-acuminate, spreading; stamens twelve in number, the stout, short filaments inserted on the inferior six-celled ovary.

In rich woods, New Brunswick to Manitoba, south to North Carolina, Missouri and Kansas. Flowering in April and May.

In southern New York occurs also the Short-lobed Wild Ginger (Asarum reflexum Bicknell) with smaller flowers, the calyx tube white within, and the triangular, acute lobes strongly reflexed.

Buckwheat Family

Polygonaceae

Swamp Smartweed

Persicaria muhlenbergii (S. Watson) Small

Plate 47a

Perennial by long rootstocks, rooting in the mud or in the water, stem erect, glabrous, or somewhat pubescent, enlarged at the nodes, 1 to 3 feet high. Leaves ovate-lanceolate or oblong-lanceolate, the upper ones often narrower, 2 to 8 inches long, acute or acuminate at the apex, rounded or cordate at the base, petioled, ocreae cylindric, becoming loose, not ciliate. Flowers in linear-oblong, dense, terminal racemes, 1 to 3 inches long; calyx dark rose-colored, five-parted; stamens five in number.

In swamps, marshes and moist soil, Ontario to British Columbia, Virginia, Louisiana and Mexico. Flowering from July to September.

Lady's-thumb; Heartweed

Persicaria persicaria (Linnaeus) Small

Plate 47b

Annual, smooth or somewhat puberulent, stems one-half to 2 feet high, erect or nearly so, simple or branched. Leaves lanceolate or linear-lanceo-

WILD OR INDIAN GINGER

Asarum canadense

A. SWAMP SMARTWEED
Persicaria muhlenbergii

B. LADY'S-THUMB; HEARTWEED
Persicaria persicaria

late, 2 to 6 inches long, nearly sessile, acuminate at both ends, conspicuously dotted, usually with a triangular or lunar dark blotch near the center; ocreae cylindric, fringed with short bristles. Flowers in dense, erect, ovoid or oblong racemes, one-half to 2 inches long, pink to dark purple; stamens usually six.

Native of Europe but naturalized and often an abundant weed in waste places throughout North America, except in the extreme north.

Arrow-leaved Tearthumb

Tracaulon sagittatum (Linnaeus) Small

Plate 48a

Stems slender, weak, annual, decumbent, or climbing over other plants by the numerous sharp, recurved prickles which arm its four prominent angles. Leaves lanceolate-sagittate or oblong-sagittate, 1 to 3 inches long, pointed at the apex, slightly rough margined, the lower leaves petioled, upper ones sessile or nearly so, prickly on the petioles and beneath on the midribs; ocreae oblique, not ciliate. Flowers in terminal heads or racemes, rose-colored or greenish; stamens usually eight in number; style three-parted.

In wet soil, Newfoundland and Nova Scotia to the Northwest Territory, south to Florida and Kansas. Flowering from July to September.

Halberd-leaved Tearthumb

Tracaulon arifolium (Linnaeus) Rafinesque

Plate 48b

Stems angled, reclining, 2 to 6 feet long from a perennial root, armed with recurved prickles. Leaves broadly hastate, long petioled, 1 to 8 inches long, pubescent or glabrous beneath, the apex and basal lobes sharp pointed; petioles and larger nerves prickly; peduncles and pedicels glandular; ocreae oblique, fringed at the summit with short bristles and at the base with slender prickles. Flowers in terminal and axillary heads or racemes, rose-colored or greenish, four parted. Stamens six; style two-parted.

In moist or wet soil and thickets, New Brunswick and Ontario to Minnesota, south to Georgia. Flowering from July to September.

Climbing False Buckwheat

Bilderdykia scandens (Linnaeus) Greene

(*Polygonum scandens* Linnaeus)

Plate 15b

Stems slender or stout, glabrous, high climbing, 2 to 20 feet long from a perennial root, somewhat rough on the ridges which mark the stem. Leaves ovate, sharp pointed, cordate at the base, 1 to 6 inches long, or the upper ones smaller, finely dotted, ocreae oblique, smooth and glabrous. Flowers in numerous panicled racemes, 2 to 8 inches long, usually interrupted with small leaves, yellowish green or whitish; calyx five-parted; stamens eight; calyx in fruit about one-half of an inch long with crisped wings.

In woods, thickets and on banks and along fence rows, Nova Scotia to Ontario and British Columbia, south to Florida, Nebraska and Texas. Flowers in August and September.

Coast Jointweed

Polygonella articulata (Linnaeus) Meisner

Plate 49a

Stems slender, wiry, erect or somewhat diffusely spreading, annual, glaucous, simple or the larger ones often much branched, 4 to 12 inches high. Leaves linear or linear-subulate, with revolute margins, sessile, one-third to 1½ inches long, jointed to the summits of the ocreae. Flowers small, in numerous terminal racemes on reflexed pedicels; calyx five-parted, its segments white with a conspicuous purple midrib.

In sand near or on the seashore from Maine to Florida, and inland on the Schenectady plains, those east of Oneida lake, and along the Great Lakes.

A. ARROW-LEAVED TEARTHUMB
Tracaulon sagittatum

B. HALBERD-LEAVED TEARTHUMB
Tracaulon arifolium

Goosefoot Family

Chenopodiaceae

Slender or Jointed Glasswort; Saltwort

Salicornia europaea Linnaeus

Plate 49b

A fleshy, glabrous annual plant, 4 to 20 inches high, usually erect and much branched, with opposite, ascending branches, their joints two to four times as long as thick. Leaves reduced to mere scales. Fruiting spikes 1 to 3 inches long. Flowers three at each joint, the middle one as high as the lateral ones. Each flower consists of a fleshy, obpyramidal three-toothed calyx, two stamens and an ovoid ovary. Seed inclosed by the spongy fruiting calyx.

Common in salt marshes along the coast from Anticosti to Georgia, and at the head of Onondaga lake.

Pokeweed Family

Phytolaccaceae

Poke; Scoke; Pigeon Berry; Garget

Phytolacca americana Linnaeus

Plate 50

A tall, strong-smelling, succulent and glabrous plant with an erect herbaceous stem 3 to 10 feet tall, from a large, perennial, poisonous root, the pith of the stem divided into discs separated by lens-shaped cavities. Leaves oblong-lanceolate or ovate-lanceolate, pinnately veined, acute or acuminate at both ends, petioled, 5 to 12 inches long. Flowers in terminal racemes, which become opposite the leaves by continued growth of the stem. Each flower about one-fourth of an inch broad, consisting of four or five rounded, white sepals; ten stamens, slightly shorter than the sepals; and a ten-celled green ovary. Fruit a long raceme of dark-purple berries, each one-fourth to three-eighths of an inch in diameter.

In waste places, fields, woods and thickets, usually in moist soil, often in stony fields and frequently a troublesome weed. Distributed from Maine

and Ontario to Minnesota, Arkansas, Florida, Mexico and Bermuda. Europe has contributed many weeds to America, but the Pokeweed or Scoke is one of the few American plants, often reckoned as a weed, which has become thoroughly naturalized in many parts of Europe.

Purslane Family

Portulacaceae

Narrow-leaved Spring Beauty

Claytonia virginica Linnaeus

Plate 51a

Stems 6 to 12 inches long, ascending or decumbent from a deep, tuberous, perennial root. Leaves linear or linear-lanceolate, glabrous and somewhat fleshy, blunt or pointed, narrowed below into a petiole, the lower leaves 3 to 7 inches long, one-eighth to one-half of an inch wide, the two-stem leaves opposite and shorter. Flowers one-half to seven-eighths of an inch broad, white or pink with darker pink veins, in a loose terminal raceme, often becoming 3 to 6 inches long. Sepals two, ovate, persistent; petals five, emarginate; pedicels slender, becoming recurved.

In moist woods, Nova Scotia to Saskatchewan, south to Georgia, Montana and Texas. Flowering in early spring. More frequently found in low woodlands and along streams in the upper part of the State, and not so frequent as the next species except near the coast.

Carolina or Wide-leaved Spring Beauty

Claytonia caroliniana Michaux

Plate 69a

Closely resembling the Narrow-leaved Spring Beauty, but usually more erect. Basal leaves ovate-lanceolate or oblong, 1 to 4 inches long, one-half to 1 inch wide, obtuse; stem leaves petioled; flowers fewer. The corm is usually thicker and depressed at the top.

In damp woods, Nova Scotia to Saskatchewan, Connecticut, south to North Carolina along the mountains, and to Ohio and Missouri. Rare or absent near the coast in New York, but very abundant in the interior where it occurs in almost every moist woodland. Flowering in the early spring.

A. COAST JOINTWEED
Polygonella articulata

B. SLENDER OR JOINTED GLASSWORT; SALTWORT
Salicornia europaea

POKE; SCOKE; PIGEON BERRY; GARGET

Phytolacca americana

Chickweed Family

Alsinaceae

Field or Meadow Chickweed

Cerastium arvense Linnaeus

Plate 63a

A densely matted or tufted perennial plant, usually more or less pubescent. Flowering stems 4 to 10 inches high, simple or sparingly branched. Lower leaves and those of the numerous sterile shoots linear-oblong, close together, slightly narrowed at the base. Leaves of the flowering stems more distant, linear or narrowly lanceolate, one-half to 1½ inches long, one-eighth of an inch wide or slightly wider. Flowers white, one-half to three-fourths of an inch broad, several in a cymose inflorescence. Petals five, obcordate or deeply notched at the ends, much longer than the lanceolate, acute sepals. Fruit a small, cylindrical capsule, a little longer than the sepals and slightly oblique at its apex.

In dry, rocky places, stony fields or ledges, Labrador to Alaska, south to Georgia, Missouri, Nevada and California. Also found in Europe and Asia. Flowering from April to July. In New York usually in bloom during some part of May.

This is a much larger flowered and more attractive plant than the Mouse-ear Chickweed (Cerastium vulgatum Linnaeus), which is naturalized almost everywhere, especially in the stony or rocky places where the Field Chickweed is found.

Pink Family

Caryophyllaceae

Bladder Campion; White Ben

Silene latifolia (Miller) Britten & Rendel

Plate 52

Stems herbaceous, from a perennial root, glaucous and glabrous, or rarely pubescent, extensively branching from the base, 6 to 20 inches high.

Leaves opposite, ovate-lanceolate, pointed, variable in size, the lower ones often spatulate. Flowers white, two-thirds to seven-eighths of an inch broad, in loose cymose panicles, often drooping; calyx tubular-campanulate, becoming globose and much inflated, about one-half of an inch long, strongly veined, with five triangular, acute lobes; petals five, each two-cleft, with or without a small crown.

In fields, meadows and waste places, New Hampshire to Ontario, New Jersey and Missouri. Native of Europe and naturalized in this country. Flowering in July and August.

Wild Pink

Silene caroliniana Walter

Plate 53

Densely tufted and perennial from a stout root, 4 to 10 inches high, viscid-pubescent, especially above, often glabrous below. Basal and lower leaves spatulate or oblanceolate, pointed or blunt, 2 to 4 inches long; stem leaves sessile, shorter, oblong or lanceolate. Flowers pink, about 1 inch broad, in terminal cymes. Calyx narrow and tubular, much enlarged by the ripening pod, its teeth ovate, pointed; petals cuneate, emarginate, eroded or finely toothed at the apex, crowned at the base of the claw.

In dry, sandy or rocky soil, Maine to Georgia, west to central New York, Pennsylvania and Kentucky.

Cuckoo-flower; Ragged Robin

Lychnis flos-cuculi Linnaeus

Plate 54a

Stems slender, erect, 1 to 2 feet high, simple or branching, from a thick, perennial root, downy-pubescent below, slightly viscid above. Lower and basal leaves spatulate or oblanceolate, 2 to 4 inches long; upper leaves lanceolate or linear-lanceolate, opposite and sessile, the uppermost leaves reduced to small bracts; flowers pink, purplish, blue, or white, three-fourths to 1 inch broad, in many-flowered panicles at the summit of the

A. NARROW-LEAVED SPRING BEAUTY
Claytonia virginica

B. ROUND-LOBED HEPATICA OR LIVERLEAF
Hepatica hepatica

BLADDER CAMPION; WHITE BEN

Silene latifolia

WILD PINK

Silene caroliniana

stems; calyx one-fourth of an inch long, ten-nerved, cylindrical, becoming campanulate in fruit, its apex with five triangular, pointed teeth; petals five, narrowly clawed, the spreading limbs each cleft into four linear lobes, of which the middle pair is longest.

Moist meadows, fields and waste places, New Brunswick to New Jersey and Pennsylvania. Frequent in cultivation. A native of Europe but thoroughly naturalized in many places in the eastern states. Flowering in July and August.

Sacred Bean Family

Nelumbonaceae

American Nelumbo or Lotus

Nelumbo lutea (Willdenow) Persoon

Plate 55

Rootstock stout, nearly horizontal, tuberiferous, in mud beneath 2 to 6 feet of water. Leaves 1 to 2 feet broad, orbicular, or somewhat constricted in the middle, centrally peltate, floating or raised a foot or two out of the water, prominently veined, smooth and dark green above, more or less pubescent and finely scaly beneath; leaf petioles and flower stems 3 to 7 feet long, rigid and tough, with several large air canals. Flowers pale yellow, fragrant, 4 to 10 inches broad; petals concave, obovate, blunt, numerous, surrounded by four or five overlapping scales. Carpels numerous, contained in pits in the large convex receptacle which becomes 3 to 4 inches long and obconic in fruit. Seeds about one-half of an inch in diameter.

In rivers and lakes, locally distributed from Massachusetts to Minnesota, Nebraska, Louisiana and Cuba. Flowering in August at Sodus bay, where a large colony of it exists. Tubers and seeds farinaceous and edible. The local distribution in the north may be due to introduction by the Indians. The Indian Lotus or Sacred Bean (Nelumbo nelumbo (Linnaeus) Karsten), with large pink flowers, is frequent in cultivation.

Water Lily Family

Nymphacaceae

Large Yellow Pond Lily; Spatter-dock

Nymphaea advena Solander

Plate 56

Floating and emersed leaves 5 to 12 inches long and 5 to 9 inches broad, ovate or orbicular-oval, thick, with a sinus 2 to 5 inches deep and generally open; submerged leaves, when present, thin and membranous; petioles, peduncles and lower surfaces of the leaves usually pubescent. Flowers $1\frac{1}{2}$ to $2\frac{1}{2}$ inches broad, depressed, globose, yellow, usually tinged with purple within; sepals six, oblong; petals fleshy, oblong truncate, one-half to two-thirds of an inch long; stamens numerous in five to seven rows; carpels numerous, united into a compound pistil which is surmounted by an undulate, yellow or pale-red stigmatic disc with twelve to twenty-four rays, ripening into an ovoid, berrylike fruit, 1 to 2 inches long and about 1 inch thick, maintained at the surface of the water or above it.

In ponds, lakes, slow streams or often subterrestrial in boggy meadows, Labrador and Nova Scotia to the Rocky mountains, south to Florida, Texas and Utah. Flowering from May to September. Consists of several races or perhaps species, differing in the character of the pistil, stigmatic disc and leaf outline. In the lakes and ponds throughout the north the small Yellow Pond Lily (Nymphaea mierophylla Persoon) is also found, with flowers 1 inch broad or less, and small leaves 2 to 4 inches long and 1 to 3 inches broad. The northern form of the larger Yellow Pond Lily is described in some books under the name of Nymphaea variegata (Morong) Greene, and a hybrid between the two, Nymphaea rubrodisea (Morong) Greene, is of frequent occurrence, having fewer stigmatic rays than N. variegata and spatulate petals. Our illustration is from a plant on Long Island.

A. CUCKOO-FLOWER; RAGGED ROBIN
Lychnis flos-cuculi

B. LYRE-LEAVED ROCK CRESS
Arabis lyrata

AMERICAN NELUMBO OR LOTUS

Nelumbo lutea

Sweet-scented White Water Lily

Castalia odorata (Aiton) Woodville & Wood

Plate 57

Aquatic, with a thick, horizontal rootstock. Leaves floating, orbicular or nearly so, 4 to 12 inches in diameter, glabrous, green and shining above, purple and somewhat pubescent beneath, the sinus open or almost closed, petioles and peduncles slender with four main air channels. Flowers white or in some varieties pink or rose-colored, 3 to 6 inches broad, very fragrant, with four greenish sepals and numerous, narrowly oblong, blunt petals, the inner ones shorter and narrower and gradually passing into stamens; stamens numerous and yellow. Carpels numerous, united into a compound pistil with radiating, linear, projecting stigmas, becoming a globose, fleshy fruit and ripening beneath the surface of the water by the coiling of the peduncles.

In ponds, lakes and slow streams, Newfoundland to Manitoba, south to Florida, Louisiana and Kansas. Flowering from June to August.

Tuberous White Water Lily

Castalia tuberosa (Paine) Greene

Plate 58

Leaves orbicular, 5 to 12 inches in diameter, floating, green on both sides, sometimes slightly pubescent beneath, sinus open or closed. Rootstock thick, with numerous lateral tuberous-thickened branches which become detached and propagate the plant. Flowers white, 4 to 9 inches broad, slightly fragrant or inodorous; petals oblong, broader than those of C. odorata, obtuse. Fruit depressed-globose.

In shallow water of bays and protected coves, Lake Champlain, Lake George, Oneida lake and along the Great Lakes to Michigan, south to Delaware and eastern Nebraska and Arkansas. Flowering in July and August.

AG46510

Crowfoot Family

Ranunculaceae

Marsh Marigold; Cowslip

Caltha palustris Linnaeus

Plate 59

A succulent, herbaceous plant with stout, glabrous, hollow stems, erect or ascending, 1 to 2 feet high, branching and bearing several or numerous bright-yellow flowers. Lower leaves long petioled, the blades cordate or reniform, 2 to 8 inches broad, with a narrow sinus, crenate, dentate, or nearly entire on the margin. Upper leaves smaller, with short petioles or sessile with nearly truncate bases. Flowers 1 to $1\frac{1}{2}$ inches broad; sepals oval, obtuse, petallike. True petals none. Stamens numerous, obovoid. Carpels several, in fruit forming follicles which are slightly compressed, about one-half of an inch long, and slightly curved outward.

In swamps, wet meadows and marshes, Newfoundland to South Carolina, west to Saskatchewan and Nebraska. Flowering in May and June.

Goldenseal; Orange-root

Hydrastis canadensis Linnaeus

Figure XV

An erect, perennial herb with a thick yellow rootstock. Stems 10 to 15 inches high. Usually each plant with a single, long-petioled basal leaf which is 5 to 8 inches broad and palmately 5 to 9-lobed, the lobes broad, pointed, sharply and unequally toothed. Stem leaves two, borne at the summit of the stem, similar in shape but smaller than the basal leaf, the uppermost leaf just below the solitary, greenish white flower, which is one-third to one-half of an inch broad. Sepals three, petallike and falling away as the flower opens. Petals none. Stamens numerous, their filaments widened and about one-sixth of an inch long; anthers oblong, obtuse. Carpels several, ripening into an ovoid, crimson head of fruit about two-

LARGE YELLOW POND LILY; SPATTER-DOCK

Nymphaea advena

SWEET-SCENTED WHITE WATER LILY

Castalia odorata

TUBEROUS WHITE WATER LILY
Castalia tuberosa

thirds of an inch long, each carpel in fruit tipped with a short recurved beak.

In moist or low woodlands, Connecticut to Minnesota, Ontario, Kansas and Missouri, south to Georgia.

Figure XV
Goldenseal or Orange-root
(Hydrastis canadensis Linnaeus)

American Globeflower

Trollius laxus Salisbury

Plate 61

Stems few or several from a perennial fibrous root, erect or ascending, often slightly fleshy but weak, from a few inches to 2 feet long. Lower

leaves long-stalked; upper ones short-stalked or sessile; blades 3 to 5 inches broad, parted into five to seven wedge-shaped, cleft or toothed segments, the blades small at flowering time, much enlarged later. Flowers 1 to $1\frac{1}{2}$ inches broad, with five to seven spreading, yellowish green, petallike sepals; true petals minute, fifteen to twenty-five in number and much shorter than the numerous yellow stamens. Fruit about 1 inch broad, consisting of several small pods (follicles) each about one-fourth of an inch long and tipped with a straight, slender beak of about one-fourth its length.

A rare or local plant of low or swampy woodlands, New England to Delaware, central and western New York to Michigan. Flowering from April to June.

Goldthread

Coptis trifolia (Linnaeus) Salisbury

Plate 60a

A low, herbaceous plant with a slender or filiform bright-yellow, bitter rootstock. Leaves all basal, evergreen, long petioled, the blade reniform, 1 to 2 inches broad, divided to the petiole into three wedge-shaped, obtuse segments, dark green, shining above, paler beneath, sharply toothed. Scape one-flowered, slender; sepals five to seven, oblong, obtuse, white; petals small and club-shaped; carpels three to seven, spreading, about one-fourth of an inch long, on stalks of about their own length, tipped with a beak.

In damp, mossy woods and bogs, Newfoundland to Virginia and eastern Tennessee, Iowa, Minnesota and Alaska.

In the Memoirs of Bastram and Marshall, page 20, it is stated that John Ellis, the eminent naturalist, in a letter to Linnaeus, dated London, April 25, 1758, says: "Mr Colden of New York, has sent Dr Fothergill a new plant, described by his daughter (Miss Jane Colden). It is called Fibraurea, gold thread. This young lady merits your esteem and does honor to your system. She has drawn and described 400 plants in your method only. She uses the English terms. Her father has a plant called after him, Coldenia; suppose you should call this Coldenella, or any other

MARSH MARIGOLD; COWSLIP

Caltha palustris

A. GOLDTHREAD
Coptis trifolia

B. HISPID BUTTERCUP
Ranunculus hispidus

AMERICAN GLOBEFLOWER

Trollius laxus

name that might distinguish her among your genera." Linnaeus, however, referred the plant to his genus Helleborus, and when it was subsequently ascertained to be distinct, Salisbury, regardless alike of gallantry and justice, imposed on it the name of Coptis.

Red Baneberry; Black Cohosh

Actaea rubra (Aiton) Willdenow

Plate 62

Stems erect, 1 to 2 feet high, from a perennial root, pubescent or smooth. Leaves ternately divided, the divisions pinnate with the lower ultimate leaflets sometimes again compound; leaflets ovate or the terminal ones obovate, toothed or more or less cleft or incised with pointed or rounded teeth. Flowers small in a dense terminal, ovoid raceme; sepals three to five, petaloid and fugacious. Petals four to ten, spatulate, shorter than the numerous white stamens; pedicels slender, one-half to two-thirds of an inch long. Fruit consisting of a raceme of bright-red, oval or ellipsoid berries, each berry about one-half of an inch long.

In woods, thickets and shaded banks, Nova Scotia to New Jersey and Pennsylvania, west to South Dakota and Nebraska. Flowering from April to early June. A variety with red berries on slender pedicles (Actaea neglecta Gillman) is occasionally found.

White Baneberry; Snakeroot

Actaea alba (Linnaeus) Miller

Plate 63b

Resembling the Red Baneberry in general habit and aspect. Leaflets usually more cut and the teeth and lobes sharply pointed. Flowers in oblong racemes; petals truncate at the apex; fruiting pedicels as thick as the peduncle or in fruit even thicker, with swollen ends, often reddish; berries short-oval, white, sometimes purplish at the ends. A variety with berries on thickened pedicels is occasionally seen.

In rich woods, Nova Scotia to Georgia, west to Minnesota and Missouri. Flowering in April and May or as late as the middle of June.

Black Snakeroot; Black Cohosh

Cimicifuga racemosa (Linnaeus) Nuttall

Plate 64

Stems tall and slender, 3 to 8 feet high, leafy above, rootstock thick and perennial. Leaves ternate with pinnate divisions; leaflets ovate or oblong, the terminal ones usually obovate, pointed at the apex, truncate or narrowed at the base, margins coarsely toothed, cleft or divided, rather thick texture, smooth or nearly so. Flowers white, with a somewhat fetid odor, in tall, terminal, simple or compound racemes, 6 to 30 inches long, each flower about one-half of an inch broad; petals four to eight, two-cleft; stamens very numerous; pistils one or two, sessile. Fruiting follicles oval, about one-fourth of an inch long, minutely beaked.

In woods and shaded rocky places, Maine and Ontario to Wisconsin, south to Georgia and Missouri. Flowering in July and August.

Wild Columbine; Rock Bells

Aquilegia canadensis Linnaeus

Plate 65

Erect and branching, glabrous or somewhat pubescent, 1 to 2 feet high, from a perennial root. Leaves ternately decompound, the lower and basal leaves slender-petioled, 4 to 8 inches broad, the ultimate leaflets 1 to 2 inches broad, sessile or short stalked, obovate, obtuse, cuneate, obtusely lobed and toothed, pale beneath; leaves of the upper part of the stem lobed or divided. Flowers nodding, 1 to 2 inches long, scarlet or rarely white or yellow; sepals five, regular, petaloid; petals concave, produced backward between the sepals into hollow, nearly straight spurs, one-half to three-fourths of an inch long, thickened at the end; stamens numerous, with the styles long exserted. Fruit erect, consisting of five united carpels with slightly spreading filiform beaks.

In rocky woodlands and clearings, Nova Scotia to the Northwest Territory, south to Florida and Texas. Flowering from the latter part of April until June.

(FLOWERS)

(FRUIT)

RED BANEBERRY

Actaea rubra

A. FIELD OR MEADOW CHICKWEED
Cerastium arvense

B. WHITE BANEBERRY; SNAKEROOT
Actaea alba

Known in many localities as Honeysuckle, a name which should more properly be applied to species of the genus Lonicera. The European Columbine (Aquilegia vulgaris Linnaeus) with showy, blue, purple or white flowers is an occasional escape from gardens into woods and fields.

Tall Anemone; Thimbleweed

Anemone virginiana Linnaeus

Plate 66

Stem stout, hairy, 2 to 3 feet tall, branching above at the involucre which is composed of two to five, usually three, short-petioled leaves; the lateral peduncles often bearing secondary involucres of smaller leaves. Basal leaves long petioled, broader than long, three-parted, the divisions broadly cuneate-oblong, variously cleft and divided into acute, serrate lobes; those of the involucres similar. Flowers two-thirds to $1\frac{1}{2}$ inches broad, on peduncles 4 to 10 inches long; sepals five, white, obtuse; stamens numerous, shorter than the sepals. Carpels numerous, forming an oblong to subcylindric head, two-thirds to 1 inch long and about one-half as thick.

In woods, thickets and clearings, Nova Scotia to Alberta, south to South Carolina, Arkansas and Kansas. Flowering from May to July or August. Consists of several races, differing in size and color of flower, shape of fruit, and in the styles. Of these, the most distinct is Anemone riparia Fernald, with smaller greenish flowers and pointed sepals.

The Slender-fruited Anemone (Anemone cylindriea A. Gray), which is frequent in sandy woods and thickets in the eastern states has silky hairy stems and tufted basal leaves with narrower divisions, white or greenish flowers about three-fourths of an inch broad and the head of fruit cylindric, 1 inch long or often longer and one-fourth to one-third as thick.

Canada or Round-leaved Anemone

Anemone canadensis Linnaeus

Plate 67

Stems slender or stout, 1 to 2 feet tall, somewhat hairy, especially on the lower surfaces of the leaves, branching at the involucre. Basal leaves

long petioled, broader than long, three to five-pointed, the divisions broad, oblong, acute, variously cleft or toothed, those of the primary and secondary involucres similar but sessile. Flowers 1 to $1\frac{1}{2}$ inches broad; sepals white or sometimes tinged with pink, oblong, obtuse; head of fruit globose, consisting of numerous flattened, orbicular, pubescent achenes, tipped with stout, persistent styles.

Low grounds, along roadsides, railroads and in open woods, Labrador to Assiniboia, Massachusetts, Maryland, Illinois, Kansas and Colorado Very closely related to Anemone dichotoma of Siberia. Flowering from May to August, by the development of secondary involucres.

Windflower; Wood Anemone

Anemone quinquefolia Linnaeus

Plate 68a

Smallest of our wild anemones. Stems simple, glabrous, 4 to 10 inches high, from horizontal, perennial rootstocks. Basal leaves long petioled, usually developing after the flowering stem, five-parted, the divisions oblong, cuneate, dentate; those of the single involucre on slender petioles one-half to 1 inch long, three- to five-parted, the divisions about $1\frac{1}{2}$ inches long, acute, variously cut and lobed. Flowers solitary, about 1 inch broad; sepals four to nine, obovate or oval, white or purplish without; head of fruit globose, inclined, consisting of several pubescent, oblong achenes, tipped with hooked styles.

Common in moist or low woodlands, Nova Scotia to Minnesota, south to Georgia and Tennessee. Flowering in April and May.

Round-lobed Hepatica or Liverleaf

Hepatica hepatica (Linnaeus) Karsten

Plate 51b

Leaves long petioled, arising with the flowering scapes directly from the fibrous roots, reniform, hairy, 2 to $2\frac{1}{2}$ inches broad when mature, spreading on the ground, three-lobed (occasionally the lateral divisions again lobed), obtuse. Flowers blue, purple or white, one-half to 1 inch

BLACK SNAKEROOT; BLACK COHOSH

Cimicifuga racemosa

WILD COLUMBINE; ROCK BELLS

Aquilegia canadensis

TALL ANEMONE; THIMBLEWEED

Anemone virginiana

broad on hairy scapes 4 to 6 inches high. Each flower subtended by an involucre of three sessile, obtuse, oblong, small leaves immediately under the flowers. Sepals oval or oblong, obtuse, longer than the numerous stamens. Fruit consisting of several oblong, acute, hairy achenes.

In woods, often in large tufts. Nova Scotia to northern Florida, west to Manitoba, Iowa and Missouri. Also in Alaska, Europe and Asia. Flowering in earliest spring, with us usually early in April but sometimes in March, and even unseasonably warm spells in midwinter may find it in flower. The leaves of Hepatica hepatica in central Europe possess blunt lobes, while our form usually has perfectly rounded lobes.

Sharp-lobed Hepatica or Liverleaf

Hepatica acutiloba DeCandolle

Plate 69b

Resembling in most respects the Round-lobed Hepatica but the leaf lobes and the leaves of the involucre are pointed, the scapes usually a little longer, and the flowers somewhat larger. The flowers are often dioecious.

In woods, Maine, Quebec and Ontario; south in the Alleghanies to Georgia; west to Missouri and Minnesota. Rare or absent near the Atlantic coast.

Puzzling forms sometimes occur which are intermediate between this and the preceding species.

Rue Anemone

Syndesmon thalictroides (Linnaeus) Hoffmannsegg

Plate 68b

Stems slender and weak, glabrous, 4 to 10 inches high; the flowering stem appearing in early spring from a cluster of tuberous roots, the ternately compound basal leaves appearing later and resembling those of the Meadow Rue, but smaller. Leaves of the involucre similar, sessile, the leaflets long petioled. Flowers perfect, few or several forming a loose umbel immediately above the involucre, white or pinkish, one-half to 1 inch broad; sepals five to ten, thin and soon falling, longer than the numerous stamens.

In woods, New Hampshire and Massachusetts to Florida, Ontario, Minnesota and Kansas. Flowering in early spring, March to early June.

Swamp or Marsh Buttercup

Ranunculus septentrionalis (Linnaeus) Poiret

Plate 70

Stems branching, 1 to 2 feet long, or becoming longer in summer, ascending, the later branches procumbent and often rooting at the nodes. Roots simply fibrous; stems glabrous or pubescent. Leaves large, petioled, three-divided, the divisions mostly stalked, usually cuneate at the base, cleft into broad lobes; petioles of the lower leaves sometimes a foot long. Flowers bright yellow, 1 to $1\frac{1}{4}$ inches broad; petals five, obovate, twice as long as the spreading sepals. Stamens numerous. Fruit a globose or oval head of flat, strongly margined achenes, each achene tipped by the subulate, persistent, sword-shaped style.

Marshes, swamps, ditches and low meadows, New Brunswick to Manitoba, Georgia and Kansas. Flowering from April to July.

Hispid Buttercup

Ranunculus hispidus Michaux

Plate 60b

Plant usually hairy when young, sometimes merely appressed-pubescent or glabrate when old; stems ascending or spreading, usually several from a thickened, fibrous, perennial root; at flowering time the stems only a few inches long, later becoming 1 to 2 feet long, but not stoloniferous. Leaves pinnately three to five divided, the divisions ovate, oblong or obovate, narrowed or cuneate at the base, sharply cleft or lobed, usually thin; flowers one-half to $1\frac{1}{2}$ inches broad; petals usually five, oblong, about twice as long as the spreading sepals and entire or sometimes slightly notched at the apex; achenes of fruit oval, lenticular, narrowly margined, abruptly tipped by a subulate style of about one-half their length.

CANADA OR ROUND-LEAVED ANEMONE

Anemone canadensis

A. WINDFLOWER; WOOD ANEMONE
Anemone quinquefolia

B. RUE ANEMONE
Syndesmon thalictroides

A. CAROLINA OR WIDE-LEAVED SPRING BEAUTY
Claytonia caroliniana

B. SHARP-LOBED HEPATICA OR LIVERLEAF
Hepatica acutiloba

In dry woods and thickets, Vermont and Ontario to North Dakota, south to Georgia and Arkansas. Flowering from March to May.

Stiff White Water Crowfoot

Batrachium circinatum (Sibthorp) Reichenbach

Plate 79a

Plant entirely submerged, except the flowers. Stems branching, usually 1 foot long or longer. Leaves about 1 inch long, spreading nearly at right angles from the stem, only slightly or not at all collapsing when drawn from the water, repeatedly forked into capillary divisions. Flowers white, one-third of an inch broad on stout peduncles, 1 to 2 inches long opposite the leaves, flowering just above the surface of the water; sepals and petals five; petals oblong-oval and blunt. Fruit a small cluster of tiny, apiculate achenes.

In ponds and slow streams, Nova Scotia to British Columbia, south to North Carolina, also in Europe and Asia. Flowering from June to September.

The form illustrated here has the beak of the achenes about 1 mm long, so that it should be classed as Batrachium longirostre (Godron) F. Schultz.

Early Meadow Rue

Thalictrum dioicum Linnaeus

Plate 71

Stems glabrous, erect, 1 to 2 feet high, slender and leafy from brown perennial roots. Leaves three to four-ternate. Leaflets thin, pale beneath, orbicular or broader, often cordate and the terminal one somewhat cuneate five to nine-lobed. Flowers dioecious, greenish or greenish yellow, drooping or spreading; panicle elongated, of numerous lateral corymbs or umbels; sepals usually four, blunt; petals none; stamens numerous, filaments longer than the sepals; anthers linear, blunt, longer than the filaments. Achenes in fruit ovoid, sessile or minutely stipitate, strongly ribbed, much longer than the style.

In woods and on shaded banks, Maine to Alabama, Saskatchewan and Missouri. Flowering in April and May.

Fall Meadow Rue

Thalictrum polygamum Muhlenberg

Plate 72

Stems stout, smooth or pubescent but not glandular or waxy, 3 to 10 feet high, branching. Leaves three to four-ternate; leaflets thickish, light green above and pale beneath, oblong or orbicular with three main apical pointed or blunt lobes; panicle compound, leafy, a foot long or more. Flowers polygamous, white or purplish, usually the pistillate flowers purplish and the staminate flowers white; filaments broad, narrowly clavate; anthers oblong, short. Fruiting achenes ovoid, sessile or short-stipulate, six to eight-winged, glabrous or pubescent.

Marshes, open sunny swamps and low meadows. Newfoundland to Florida, Ontario and Ohio. Flowering from July to September.

Virgin's Bower; Woodbine; Wild Clematis

Clematis virginiana Linnaeus

Figure XVI and Plate 73

A long vine, climbing over bushes in low woodlands, and along fences and watercourses. Stems somewhat woody below but only the root perennial in the north at least. Leaves opposite, glabrous, trifoliate; leaflets broadly ovate, acute at the apex, toothed or lobed, sometimes slightly cordate. Flowers in leafy panicles, white, polygamo-dioecious, two-thirds to $1\frac{1}{4}$ inches broad when expanded. Sepals usually four, spreading, petallike; petals none; stamens numerous, spreading; filaments glabrous; pistils numerous. In fruit the styles become an inch long or more, plumose and persistent on the achenes (figure XVI).

Nova Scotia to Georgia, west to Manitoba and Tennessee. Flowering in midsummer, July to September.

SWAMP OR MARSH BUTTERCUP

Ranunculus septentrionalis

Figure XVI

Virgin's Bower (Clematis virginiana Linnaeus), in fruit

Purple Virgin's Bower

Atragene americana Sims

(*Clematis verticillaris* De Candolle)

Figure XVII

A trailing or partly climbing vine, somewhat woody and perennial below, glabrous or nearly so. Leaves trifoliate; leaflets thin, ovate, acute, toothed or entire and more or less cordate; petioles and petiolules slender. Flowers purplish blue, 2 to 4 inches broad, solitary on slender peduneles in the axils of the leaves or at the ends of the branches. Sepals four, thin and translucent, strongly veined, silky along the margins and veins; petals four, spatulate, one-half to two-thirds of an inch long; stamens very numerous, the outer ones usually with broadened filaments; styles long, persistent, plumose throughout and about 2 inches long in fruit.

Rocky woodlands and thickets, Hudson bay to Manitoba, south to Connecticut, Virginia and Minnesota. Flowering in May and June. One of our rarest wild flowers.

Erect Silky Leather Flower

Viorna ochroleuca (Aiton) Small

Plate 74

Stems erect, silky-hairy, 1 to 2 feet high and somewhat woody at the base from a thickened, woody, perennial root. Leaves opposite, simple, sessile, ovate or elliptical-ovate, blunt, smooth and glabrous above, silky and reticulate-veined beneath, entire or rarely somewhat lobed; each stem with a single terminal nodding flower about 1 inch long or less. Calyx rather broadly cylindric in shape, composed of four or five thick sepals, very silky without, their yellowish-green tips recurved; petals none. Stamens numerous, parallel with the sepals, their anthers very narrow. Pistils very numerous, their styles silky or plumose. In fruit the fleshy sepals fall away leaving an erect head of small achenes plumose with the long, yellowish-brown, persistent styles which are 1 to 2 inches long.

EARLY MEADOW RUE
Thalictrum dioicum

FALL MEADOW RUE

Thalictrum polygamum

Figure XVII
Purple Virgin's Bower
(Atragene americeana Sims)

Sandy fields and thickets, Staten Island and Pennsylvania, south to Georgia. Flowering in late May and June. In the southern states several additional species of Leather Flower (Viorna) are found, but this is the only one which enters New York.

Barberry Family

Berberidaeeae

Blue Cohosh

Caulophyllum thalictroides (Linnaeus) Michaux

Plate 75

Stems erect, glabrous and glaucous when young, 1 to 3 feet high from a thickened, perennial rootstock; the base of the stem with two or three large, sheathing bracts, near the top of the stem a single, large, triternate, nearly sessile leaf and usually a similar but smaller leaf near the base of the inflorescence. Leaflets thin, oval, oblong or obovate, 1 to 3 inches long when mature, usually only partly developed at flowering time, three to five-lobed at the apex. Flowers several in a loose terminal panicle, greenish purple, one-quarter to one-half of an inch broad; sepals six, oblong; petals six, smaller, cucullate and opposite the sepals; stamens six. Each flower contains a single pistil with two ovules, which ripens into a globose, blue, glaucous, berrylike fruit, about one-third of an inch in diameter. As the seed grows it ruptures the thin, transparent pericarp before maturity.

In woods and thickets, New Brunswick to South Carolina, west to Manitoba, Tennessee, Nebraska and Missouri. Flowering in April and May.

May Apple; Wild Mandrake

Podophyllum peltatum Linnaeus

Plate 76

Stems erect, 1 to $1\frac{1}{2}$ feet high, from a perennial, horizontal, poisonous rootstock. Basal leaves centrally peltate, often nearly a foot in diameter, long petioled, deeply five to nine-lobed, glabrous or pubescent and light green on the lower surface, darker above; lobes two-cleft and toothed at

VIRGIN'S BOWER; WOODBINE; WILD CLEMATIS

Clematis virginiana

ERECT SILKY LEATHER FLOWER

Viorna ochroleuca

the apex. Flowering stems appearing from different rootstocks, bearing one to three, usually two, similar leaves (rarely leaflets). Flowers $1\frac{1}{2}$ to 2 inches broad, white, fragrant, on stout, nodding peduncles one-half to 2 inches long, appearing from the base of the upper leaf or usually from the fork between the two leaves; sepals six, petallike and soon falling. Petals six to nine, flat, obovate, longer than the sepals; stamens twice as many as the petals. Ovary ovoid, forming in fruit a large, yellowish, ovoid, edible berry, $1\frac{1}{2}$ to 2 inches long, the numerous seeds inclosed in fleshy arils within the fruit.

In low woods, moist banks and clearings, western Quebec and southern Ontario to Minnesota, Kansas, Florida, Louisiana and Texas. Flowering in May and June.

The fruit is edible and harmless, although somewhat insipid and to many people its taste is disagreeable. Both foliage and root are said to be poisonous and serious results have followed the use of the leaves as greens. The root is a violent purgative, resembling jalap in its action. Its popular name, Mandrake, relates it in no way to the Mandrake or Mandragora of the ancients and, notwithstanding its poisonous character it is a very respectable herb in comparison with the traditions of the Mandrake of the ancients, described as flourishing best under a gallows, with a root resembling a man in shape, uttering terrible shrieks when it was torn from the ground, and possessing the power of transforming men and beasts.

Twin-leaf

Jeffersonia diphylla (Linnaeus) Persoon

Figure XVIII

A smooth, perennial, fibrous-rooted plant, 6 to 8 inches high when in flower, later becoming 10 to 18 inches high. Leaves and flowering stems arising from a scaly base. Leaves glaucous beneath, long petioled, cordate or reniform, 3 to 6 inches long, 2 to 4 inches wide when mature, parted longitudinally into two obliquely ovate, blunt, lobed or entire divisions; lobes rounded with sinuses sometimes three-fourths of an inch deep. At

(Photograph by G. A. Bailey)

Figure XVIII

Twin-leaf

(Jeffersonia diphylla (Linnaeus) Persoon)

BLUE COHOSH

Caulophyllum thalictroides

MAY APPLE; WILD MANDRAKE
Podophyllum peltatum

flowering time the leaves are but partially developed. Flowering stems without leaves and one-flowered. Flowers white, about 1 inch broad; the calyx with four (sometimes three or five) caducous, petallike divisions. Petals eight, flat, oblong, longer than the sepals. Stamens eight with slender filaments. Fruit a short-stalked capsule about 1 inch long, opening at maturity near the summit by a half-circumscissle cleft.

In moist woods, New York, Ontario and Pennsylvania to Wisconsin, Iowa, Virginia and Tennessee. Flowering in April and May.

Poppy Family

Papaveraceae

Bloodroot; Puccoon-root

Sanguinaria canadensis Linnaeus

Plate 77

Leaves and stems glabrous, especially when young, from a stout, horizontal rootstock, one-half to 1 inch thick, densely clothed with thick, fibrous roots. Juice of the roots and stems red. Leaves basal on petioles 6 to 14 inches long, palmately five to nine-lobed, the lobes repand or cleft at the apex and palmately veined. Flowering scapes, one-flowered, at length overtopped by the mature leaves, but at flowering time longer than the partially unfolded immature leaves. Flowers white or sometimes pinkish, 1 to 1½ inches broad; sepals two, soon falling. Petals eight to sixteen, oblong-spatulate, arranged in two or three rows and soon falling; stamens numerous, yellow. Fruit a narrow, one-celled, two-valved capsule, pointed at both ends, about 1 inch long.

In rich woods and on shaded banks, Nova Scotia to Manitoba and Nebraska, south to Florida, Alabama and Arkansas. Flowering in April and May.

Fumewort Family

Fumariaceae

Dutchman's-breeches

Bicuculla cucullaria (Linnaeus) Millspaugh

Plate 78

A rather delicate, smooth and somewhat tufted herbaceous plant from a bulbous, perennial base. Leaves all basal, numerous and slender-stalked, pale beneath, finely divided into many narrow segments. Flowers nodding, fragrant, few or several on a slender stalk which rises above the leaves; each flower about one-half to two-thirds of an inch long, and somewhat broader than long across the spreading basal spurs, white or faintly pink, yellow at the summit; the four petals in two pairs, the outer pair oblong, concave, each with a divergent spur at the base and the tip spreading, the inner pair narrow and minutely crested. Fruit an oblong pod, opening into two parts to the base when mature.

In rich woods, Nova Scotia to North Carolina, west to Minnesota, Kansas and Missouri. Flowering in April and May.

The Squirrel Corn or Turkey Corn (Bicuculla canadensis (Goldie) Millspaugh) is similar, but the spurs of the two outer petals are shorter, rounded and not divergent, the inner pair of petals is conspicuously crested and the roots have numerous small tubers. The Wild Bleeding Heart (Bicuculla eximia (Ker) Millspaugh) of the western part of the State has pink flowers.

Mountain Fringe; Alleghany Vine

Adlumia fungosa (Aiton) Greene

Plate 79b

Stems weak, slender, climbing several feet over other plants by its slender petioles from a biennial root. Leaves two to three-pinnate, the leaflets slender stalked, lobed or entire, very thin, ovate or cuneate, about one-fourth of an inch long and pale beneath. Flowers numerous in axillary

BLOODROOT; PUCCOON-ROOT

Sanguinaria canadensis

drooping cymes; petals four, united into a narrowly ovate-cordate, spongy corolla about one-half of an inch long and one-fourth of an inch broad at the base, four-lobed at the apex, greenish purple, or pink, usually rather persistent, dry and brownish with age; stamens six, united below and adherent to the petals. Fruiting capsule oblong, included in the persistent, dry corolla.

In moist woods, thickets and shaded cliffs, New Brunswick to Ontario and Michigan, south to North Carolina and Tennessee. Flowering from June to October. Frequent in cultivation.

Pink or Pale Corydalis

Capnoides sempervirens (Linnaeus) Borkhausen

Plate 80

Stems and leaves glabrous, glaucous, erect or ascending, 6 inches to 2 feet high and freely branching. Lower leaves 1 to 5 inches long, short petioled, the upper leaves sessile or nearly so, all divided into numerous obovate or cuneate segments, toothed or entire, obtuse. Flowers numerous, panicled, borne in cymose clusters at the ends of the branches. Each flower one-half to two-thirds of an inch long, pink or rarely white with a yellow tip; sepals two, small; corolla irregular, deciduous; petals four, erect-connivent, one of the outer pair with a spur at the base about one-eighth of an inch long, the inner pair narrower, keeled at the back. Capsules narrowly linear, erect, 1 to 2 inches long.

In rocky places, Nova Scotia to Alaska, Georgia, Minnesota, Montana and British Columbia. Flowering from May to September.

Two other species of this genus are occasionally found in this State, both with low, diffusely spreading stems and with yellow flowers. They are the Yellow Corydalis (Capnoides flavulum (Rafinesque) Kuntze) with flowers about one-fourth of an inch long and short spurred; and the Golden Corydalis (C. aureum (Willdenow) Kuntze) with flowers slightly more than one-half of an inch long and spurs one-half the length of the corolla.

Mustard Family

Crueiferae

Lyre-leaved Rock Cress

Arabis lyrata Linnaeus

Plate 54b

A low, tufted perennial or biennial plant with ascending or erect stems, 4 to 12 inches high, smooth above, pubescent below or glabrous throughout. Basal leaves lyrate-pinnatifid, 1 to 2 inches long, spatulate or oblanceolate, pubescent or glabrous; stem leaves entire or toothed, spatulate or linear, one-half to 1 inch long. Flowers white, one-fourth of an inch broad or less, several or numerous in a terminal raceme which elongates in fruit; pedicels ascending, about one-third of an inch long or longer in fruit; petals four, much longer than the four stamens. Fruit a linear, slightly flattened pod three-fourths to $1\frac{1}{4}$ inches long; seeds in one row, oblong and wingless.

Rocky and sandy places, Connecticut and Ontario west to Manitoba and Alaska, south to Virginia, Tennessee, Missouri and British Columbia. Flowering from April to September.

Bulbous Cress; Cuckoo-flower

Cardamine bulbosa (Schreber) Britton, Sterns & Poggenberg

Plate 90a

A slender, erect, herbaceous plant with smooth stems, 6 to 20 inches high from a perennial, tuber-bearing root, simple or rarely branched. Leaves of two sorts, those of the stem sessile and clasping or the lower ones very short petioled, rather distant from one another, oblong or lanceolate, blunt, toothed or entire, 1 to 2 inches long; the basal leaves oval or orbicular, one-half to 2 inches broad, often slightly heart-shaped, toothed or usually entire, with long, slender petioles. Flowers white, about one-half of an inch broad, in a terminal, several to many-flowered cluster; petals four, three to four times the length of the four sepals. Fruit a

DUTCHMAN'S-BREECHES
Bicuculla cucullaria

A. STIFF WHITE WATER CROWFOOT
Batrachium circinatum

B. MOUNTAIN FRINGE; ALLEGHANY VINE
Adlumia fungosa

PINK OR PALE CORYDALIS

Capnoides sempervirens

number of erect, very slender pods, narrowed at eaeh end and about an ineh long.

In low, wet woods, thiekets and wet meadows, New Brunswiek to Vermont, southern Ontario and Minnesota, south to Florida and Texas. Flowering in April and May, or in eool woods as late as early June.

The Purple Cress (C a r d a m i n e d o u g l a s s i i: (Torrey) Britton) has leaves whieh are more angularly toothed and showy purple flowers often three-fourths of an ineh broad. It is found in eold, springy plaees in the northern part of the State.

The True Water-eress (S i s y m b r i u m n a s t u r t i u m-a q u a t i e u m Linnaeus) is a native of Europe, but is eommon in brooks and streams in most parts of New York.

Cut-leaved Toothwort or Pepperroot

Dentaria laciniata Muhlenberg

Plate 81a

Stems erect, pubeseent or glabrous, 8 to 15 inehes high from a deep, perennial, tubereled, jointed rootstoek, the joints easily separable. Leaves all petioled, 2 to 5 inehes broad, those on the stem usually three and forming a whorl, rarely distant, three-parted nearly to the base, the divisions laneeolate, linear or oblong, the lateral ones often deeply eleft, all deeply toothed or lobed; basal leaves similar, usually developing later than the flowering stems. Flowers numerous in a stout, broad raeeme, two-thirds to three-fourths of an ineh broad, pink or white. The four petals longer than the sepals. Stamens six. Fruiting pod linear, aseending, 1 to $1\frac{1}{2}$ inehes long.

In moist or rich woods, Quebee to Florida, west to Minnesota, Kansas and Louisiana. Flowering in April and May.

Two-leaved Toothwort or Crinkleroot

Dentaria diphylla Miehaux

Plate 81b

Stems stout, simple, glabrous, 6 to 14 inehes high from a perennial, notehed but eontinuous rootstoek. Basal leaves long petioled, 4 to 5 inehes

broad, with three broadly ovate, dentate or somewhat lobed leaflets each about 2 inches long; stem leaves usually two, opposite or nearly so, short petioled and also three-divided, the leaflets often narrower than those of the basal leaves. Flowers white, one-half to two-thirds of an inch broad.

In rich woods, Nova Scotia and New Brunswick to Minnesota, south to South Carolina and Kentucky. Flowering usually in late April and in May.

The Large Toothwort (D e n t a r i a m a x i m a Nuttall) has a jointed rootstock and three stem leaves (sometimes two or as many as five or six), alternate, with ovate and obovate toothed and cleft leaflets and large pale-purple flowers. It is rare and local in distribution.

The species of Dentaria are members of the Mustard family (Crueiferae) which contains a very large number of small-flowered, inconspicuous plants, many of them weeds, as well as a number of cultivated species which have become naturalized or established throughout the State.

American Sea Rocket

Cakile edentula (Bigelow) Hooker

Plate 82a

Plant very fleshy throughout, bushy branched from a deep, annual root, the lower branches spreading or ascending, the center ones erect, a few inches to a foot high. Leaves oblanceolate or obovate, obtuse, lobed or toothed, narrowed at the base, the lower leaves 2 to 5 inches long, the upper leaves smaller. Flowers light purple, less than one-fourth of an inch broad, the four petals long-clawed, more than twice the length of the sepals; fruit one-half to 1 inch long, the upper joint slightly longer than the lower, ovoid, angled, flattened, narrowed above into a beak; lower joint obovoid, not flattened.

Sandy places along the seashore, Newfoundland to New Jersey and Florida, and along the Great Lakes, New York to Minnesota.

A. CUT-LEAVED TOOTHWORT OR PEPPERROOT
Dentaria laciniata

B. TWO-LEAVED TOOTHWORT OR CRINKLEROOT
Dentaria diphylla

A. AMERICAN SEA ROCKET
Cakile edentula

B. YELLOW MOUNTAIN SAXIFRAGE
Leptasia aizoides

Pitcher Plant Family

Sarraceniaceae

Pitcher Plant; Sidesaddle Flower

Sarracenia purpurea Linnaeus

Plate 83

Leaves tufted, ascending, hollow, much inflated and trumpet-shaped, 4 to 12 inches long, with a broad, lateral wing and an erect terminal lid or lamina, glabrous except the inner side of the lamina and the inner surface of the pitchers, which are densely clothed with stiff, reflexed hairs, purple-veined or sometimes green, yellowish or reddish all over, narrowed into petioles below, persistent over winter. Roots large, stout and fibrous. Flowers solitary on slender scapes, 1 to 2 feet high, nodding, deep purple or rarely yellow, nearly globose, $1\frac{1}{2}$ to $2\frac{1}{4}$ inches broad; sepals five, green, with three or four bracts at the base; petals five, obovate, narrowed in the middle, incurved over the yellowish style. Style dilated at the apex into a peltate umbrellalike structure with five rays which terminate under its angles in hooked stigmas.

In peat bogs and wet sphagnous places, Labrador to the Canadian Rocky mountains, Florida, Kentucky and Iowa. Flowering in May and June. The pitcher-shaped leaves usually contain more or less water in which are numerous drowned insects which furnish food for the larvae of a fly which is instrumental in the cross-pollination of the flowers.

Sundew Family

Droseraceae

Spatulate-leaved Sundew

Drosera intermedia (Linnaeus) Hayne

Plate 84

A tufted bog plant with erect, flowering scapes, 2 to 8 inches high, and elongated rootstocks. Leaf blades ascending, spatulate, obtuse at the apex, one-fourth to three-fourths of an inch long, one-half to one-third as

wide as long, clothed above with long, glandular hairs secreting a fluid which entraps insects, narrowed below into glabrous petioles one-half to $1\frac{1}{2}$ inches long; usually the entire foliage reddish or greenish red in color. Flowers several in one-sided racemes; petals five, white, slightly longer than the greenish sepals; the one-celled ovary surmounted by three styles, each deeply two-parted so as to appear like six.

In bogs and sphagnous places, Newfoundland to Saskatchewan, south to Florida and Louisiana, and also in northern Europe. Flowering from June to August.

The Spatulate-leaved Sundew is not so common as the Round-leaved Sundew (Drosera rotundifolia Linnaeus), with orbicular leaf blades. Two additional Sundews occur in New York, namely the Oblong-leaved Sundew (Drosera longifolia Linnaeus), with leaf blades elongated-spatulate, six to eight times as long as wide; and the Thread-leaved Sundew (D. filiformis (Linnaeus) Rafinesque), with linear leaves ten to fifteen times as long as wide and purple flowers. The last grows in wet sand near the coast, the others in bogs.

Virginia Stonecrop Family

Penthoraceae

Ditch or Virginia Stonecrop

Penthorum sedoides Linnaeus

Plate 87b

Stems erect, glabrous, often branched and angled above, 6 inches to 2 feet high, from a perennial root. Leaves alternate, sessile, lanceolate or narrowly elliptic, acuminate at each end, finely toothed, 2 to 4 inches long, one-half to 1 inch wide. Flowers perfect, yellowish green, in two or three forked, one-sided cymes, the branches 1 to 3 inches long. Each flower about one-fifth of an inch broad; calyx five-parted, the sepals triangular-ovate, pointed, shorter than the flattish capsule; stamens ten; petals often lacking, when present, linear or linear-spatulate. Fruit a depressed, five-lobed capsule with five divergent tips.

PITCHER PLANT; SIDESADDLE FLOWER

Sarracenia purpurea

SPATULATE-LEAVED SUNDEW
Drosera intermedia

Common in ditches and swampy places, New Brunswick to Florida, west to Nebraska, Kansas and Texas. Flowering from July to September.

Not a very attractive plant, but the only American representative of the Penthoraceae (Virginia Stonecrop family), which is joined with the Saxifrage family by some authors and to the Orpine family by others.

Grass-of-Parnassus Family

Parnassiaceae

Carolina Grass-of-Parnassus

Parnassia caroliniana Michaux

Plate 85

Flowering scape 6 to 20 inches high, with a sessile, ovate, clasping leaf below the middle. Basal leaves very numerous, ovate, oval, or nearly orbicular, obtuse at the apex, rounded or slightly cordate at the base, or decurrent on the petiole, 1 to 2 inches long, on petioles 2 to 6 inches long. Flowers three-fourths to $1\frac{1}{2}$ inches broad; calyx lobes five, ovate-oblong, obtuse and much shorter than the five broadly oval, white, greenish veined petals; each petal with a set (usually three) of gland-tipped staminodia at the base which do not exceed the five fertile stamens in length, the latter alternate with the petals. Fruit a one-celled capsule about one-half of an inch long.

In swamps, low meadows and boggy places, New Brunswick to Manitoba, south to Virginia, Illinois and Iowa. Flowering from July to September, rarely earlier than July in our latitude. At Taberg growing on wet cliffs with the Yellow Mountain Saxifrage and Dwarf Canadian Primrose.

Saxifrage Family

Saxifragaceae

Yellow Mountain Saxifrage

Leptasea aizoides (Linnaeus) Haworth

Plate 82b

Stems tufted, forming loose or dense leafy mats, 2 to 7 inches high. Leaves alternate, linear, thick, fleshy, sharply pointed at the apex, sessile,

one-third to three-fourths of an inch long, one-eighth of an inch wide or usually less, sometimes sparingly ciliate on the margins. Flowers several, corymbose, one-third to two-thirds of an inch broad on slender pedicels; petals five, oblong, yellow and often spotted with orange, longer than the ovate calyx lobes and alternate with them. Stamens ten; ovary almost superior, the two capsules united to above the middle.

On wet or dripping rocks, Newfoundland and Labrador to Vermont, northern and western New York, and west through Arctic America to the Rocky mountains. Also in Alpine and Arctic Europe and Asia. Flowering in July and August.

Early Saxifrage

Micranthes virginiensis (Linnaeus) Small

Plate 87a

Flowering stem 4 to 12 inches high, viscid-pubescent with whitish hairs, leafless or with a few green bracts at the base of the inflorescence. Leaves all basal, 1 to 3 inches long, obovate, or oval, toothed, blunt or pointed at the apex, spatulate at the base and narrowed into a margined petiole; inflorescence cymose, becoming paniculate by the elongation of the lower branches. Flowers white, less than one-fourth of an inch broad; calyx of five erect, triangular, pointed lobes; petals five, oblong-spatulate, obtuse, longer than the calyx; stamens ten, carpels of the fruit usually two, nearly separate, widely divergent when mature.

In dry or rocky woodlands, banks and ledges, New Brunswick to Minnesota, south to Georgia and Tennessee. Flowering from April until June.

Swamp Saxifrage

Micranthes pennsylvanica (Linnaeus) Haworth

Plate 86

Flowering scape stout, viscid-pubescent, 1 to $3\frac{1}{2}$ feet high, with green bracts at the inflorescence, otherwise leafless. Leaves all basal, large, oval, ovate, obovate or oblanceolate, pubescent or nearly glabrous, 4 to 10 inches long, obtuse at the apex, narrowed below into a broad petiole,

GRASS-OF-PARNASSUS

Parnassia caroliniana

the margins denticulate or repand. Flowers in elongated, loose, terminal panicles, greenish. Each flower about one-eighth of an inch broad or slightly broader; the obtuse calyx lobes reflected; petals five, lanceolate or linear-lanceolate, twice as long as the calyx.

Swamps, wet banks and wet woods, Maine to Ontario, Minnesota, Virginia, Iowa and Missouri. Flowering in May and June.

Foamflower; False Miterwort

Tiarella cordifolia Linnaeus

Plate 88

Flowering scapes 6 to 12 inches high, slender and pubescent, from a rather stout, perennial root. Leaves all basal, long petioled, broadly ovate or nearly orbicular, cordate at the base, three to seven-lobed, blunt or pointed at the apex, 2 to 4 inches long, margins crenate or dentate, pubescent above with scattered hairs, glabrate or downy along the veins beneath. Flowers white, forming a terminal raceme, 1 to 4 inches long. Each flower about one-fourth of an inch broad; petals five, oblong, entire or slightly toothed, somewhat longer than the five white calyx lobes; stamens ten, anthers reddish or yellowish. Fruit of two very unequal carpels, about one-fourth of an inch long, reflexed on slender pedicels.

In rich, moist woods, Nova Scotia to Ontario and Minnesota, south along the mountains to Georgia, and west to Indiana and Michigan. Flowering from April to June. Also known as Coolwort.

Alumroot

Heuchera americana Linnaeus

Plate 89

Flowering stem rather stout, $1\frac{1}{2}$ to 3 feet high, leafless, glandular, hirsute. Leaves basal, long petioled, 3 to 4 inches wide with seven to nine rounded, crenate-dentate lobes; the older leaves glabrous or with scattered hairs on the upper surfaces, new leaves usually somewhat pubescent. Flowers greenish yellow, in elongated panicles; calyx tube broadly

campanulate, nearly regular, somewhat less than one-fourth of an inch long, five-lobed; petals five, very small, greenish and alternate with the lobes of the calyx which they do not exceed in length. Stamens five, projecting out from the calyx more than one-half their length, anthers orange.

In dry or rocky woods and banks, Ontario to Connecticut, west to Minnesota, south to Alabama and Louisiana. Flowering from May to August.

Two-leaved Bishop's Cap; Miterwort

Mitella diphylla Linnaeus

Plate 90b

Stems erect, often several together from a perennial root, 8 to 17 inches high, pubescent, each stem bearing a pair of opposite, sessile or nearly sessile leaves near or above its middle. Basal leaves broadly ovate, cordate at the base, acute or long pointed at the apex, three to five-lobed, toothed, rather rough-hairy on both sides, 1 to 2 inches long. Flowers small, white, rather distant from one another, in a very narrow, elongated, erect raceme, 3 to 8 inches long; calyx tube bell-shaped, five-lobed; petals five, finely pinnatifid. Fruiting capsules one-celled, two-valved at the apex, many seeded, somewhat flattened and broad, seeds smooth, black and shiny.

In rich woods, Quebec to Minnesota, North Carolina and Missouri. Flowering in April and May.

In cold woods and bogs of the northern part of the State occurs a smaller species of Miterwort, M i t e l l a n u d a Linnaeus, with reniform-orbicular, basal leaves and the stems usually without leaves; flowers greenish yellow. Another species, M. o p p o s i t i f o l i a Rydberg, has been described from central New York which differs from M. d i p h y l l a only in having long-petioled stem leaves, lanceolate calyx lobes and filiform divisions to the petals.

SWAMP SAXIFRAGE

Micranthes pennsylvanica

A. EARLY SAXIFRAGE
Micranthes virginiensis

B. DITCH OR VIRGINIA STONECROP
Penthorum sedoides

FOAMFLOWER; FALSE MITERWORT

Tiarella cordifolia

Rose Family

Rosaceae

Meadowsweet; Quaker Lady

Spiraea latifolia (Aiton) Borkhausen

Plate 93a

An erect shrub, 2 to 6 feet high, usually more or less branched above and smooth with reddish stems. Leaves short petioled, blades oblanceolate or obovate, glabrous or nearly so, coarsely toothed, 1 to 2 inches long, one-half to 1½ inches wide, usually larger on young shoots, obtuse or slightly pointed at the apex, rounded or tapering at the base, pale beneath. Flowers white or pinkish, in dense terminal panicles, each flower about one-fourth of an inch broad or less; petals four or five, inserted on the calyx; stamens numerous. Pistils commonly five, alternate with the calyx lobes.

In moist or rocky places, in open woods, or in old meadows and along roadsides, Newfoundland to Saskatchewan, Virginia and western Pennsylvania. Flowering from June to August.

The Narrow-leaved Meadowsweet (Spiraea alba Du Roi) has yellowish brown branches, narrowly oblanceolate to oblong leaves and white flowers. It is much less abundant than Spiraea latifolia, and is found in wet soil, Ontario to New York, south to North Carolina, west to Indiana, Missouri and Saskatchewan.

Hardhack; Steeplebush

Spiraea tomentosa Linnaeus

Plate 94a

Erect, shrubby and perennial at least below, the tops usually dying back, 1 to 3 feet tall, usually simple; stems floccose-pubescent. Leaves short petioled, ovate or oval, 1 to 2 inches long, one-half to 1 inch wide, unequally toothed, blunt or pointed at the apex, narrowed or rounded at the base, smooth and dark green above, woolly-pubescent with whitish hairs beneath. Flowers pink or purplish, rarely white, in dense terminal

panicles, each flower about one-fifth of an inch broad; divisions or follicles of the fruit pubescent.

In wet meadows, swamps and low ground, Nova Scotia to Manitoba south to Georgia and Kansas. Flowering from July to September.

The Corymbed Spiraea (Spiraea corymbosa Rafinesque), with oval, ovate or orbicular leaves, slightly cordate at the base, or rounded, and with small white flowers in dense terminal, often leafy corymbs, is found occasionally on rocky banks and in wood of the southern part of the State.

Indian Physic; Bowman's Root

Porteranthus trifoliatus (Linnaeus) Britton

Plate 91

Stems erect, herbaceous, 2 to 4 feet high, from a perennial root, usually branched, glabrous or slightly pubescent. Stipules small, one-eighth to one-fourth of an inch long, entire or toothed. Leaves sessile or nearly so, three-foliate; leaflets oval, ovate, lanceolate or slightly obovate, long pointed at the apex, narrowed at the base, 2 to 3 inches long, irregularly toothed. Flowers white or pinkish, one-half to two-thirds of an inch long on slender peduncles, in loose, terminal, leafy panicles; calyx reddish, five-toothed, ten nerved; petals five, linear-lanceolate, somewhat unequal.

In woods and thickets, Ontario and New York to Michigan, Georgia and Missouri. Flowers in June and July.

A closely related species, Porteranthus stipulatus (Muhlenberg) Britton, has incised leaflets, broad, foliaceous, incised stipules and slightly smaller flowers. Its range is about the same.

Common Five-finger or Cinquefoil

Potentilla canadensis Linnaeus

Plate 92a

Stems ascending, a few inches high, spreading by slender runners 3 inches to 1 or 2 feet long; the pubescence of the stem, petioles and peduncles spreading. Leaves petioled, digitately five-foliated; leaflets oblanceolate

ALUMROOT

Heuchera americana

A. BULBOUS CRESS; CUCKOO-FLOWER
Cardamine bulbosa

B. TWO-LEAVED BISHOP'S CAP OR MITERWORT
Mitella diphylla

INDIAN PHYSIC; BOWMAN'S ROOT

Porteranthus trifoliatus

to oblong, blunt at the apex, narrowed at the base, one-half to 1 inch long, toothed. Flowers yellow, one-fourth to three-fourths of an inch broad on slender, axillary, one-flowered peduncles; the first flower appearing from the axil of the second stem leaf; petals five, broadly oval, slightly longer than the acute calyx lobes and the linear-lanceolate bractlets; stamens about twenty.

In dry soil of meadows and fields, New Brunswick to Georgia, Minnesota and Texas. Flowering from April to August.

The genus Potentilla contains a number of representatives in New York, several of which are introduced species. Of these, the most common is the Rough Cinquefoil (P o t e n t i l l a m o n s p e l i e n s i s Linnaeus), with stout, erect, hairy stems and leaves, and yellow flowers in which the calyx lobes exceed the petals in length.

The Silvery Cinquefoil (P o t e n t i l l a a r g e n t e a Linnaeus) is a native species of dry soils or rocky places, with spreading or ascending, white, woolly-pubescent stems, leaflets green and smooth above and white-tomentose beneath, the margins revolute, and small yellow flowers.

Rough-fruited Cinquefoil

Potentilla recta Linnaeus

Plate 95

Stems erect, stout, branched above, villous-pubescent, 1 to 2 feet high from a stout, perennial root, with ovate-lanceolate stipules, the lower foliaceous and cut. Leaves digitately five to seven-foliate, petioled or the upper leaves nearly sessile; leaflets oblanceolate, blunt at the apex, narrowed at the base, pubescent with scattered hairs above, more densely pubescent beneath, sharply toothed, 1 to 3 inches long. Flowers numerous, bright or dull yellow, about three-fourths of an inch broad, in terminal, cymose clusters; stamens about twenty.

Roadsides, fields and waste places, Maine to Ontario, New York, Virginia and Michigan. Naturalized from Europe and Asia. Flowering from June to September.

Silverweed; Wild or Goose Tansy

Argentina anserina (Linnaeus) Rydberg

Plate 92b

Stems and leaves herbaceous and tufted from a perennial root; spreading by slender runners, 8 inches to 3 feet long. Leaves pinnate, 3 to 18 inches long; leaflets seven to twenty-five, oblong, oblanceolate or obovate, obtuse, the lower leaflets usually smaller, often with still smaller ones interspersed, all sharply toothed, nearly glabrous above, white or silky-pubescent beneath. Flowers yellow, three-fourths to $1\frac{1}{8}$ inches broad, solitary on erect axillary peduncles; petals five, broadly oval or obovate, longer than the five ovate, pointed sepals and the five oval bractlets; stamens about twenty, borne around the base of the hemispheric, villous receptacle.

Lake shores, sandy fields and salt meadows, New Jersey to Greenland, west to Nebraska, British Columbia and Alaska, south in the Rocky mountains to New Mexico and California; also in Europe and Asia. Flowering from May to September. Consists of several or numerous races, differing in the size and shape of the leaflets, and slightly in the achenes. Small northern plants have been referred to A. egedii of Greenland, and a form from Oneida lake has been described as A. babeockiana Rydberg.

Purple or Marsh Cinquefoil; Purplewort

Comarum palustre Linnaeus

Plate 96a

Stems decumbent, often rather long, somewhat woody and perennial at the base; pubescent above. Leaves pinnate, upper leaves three to five-foliate, nearly sessile, lower ones successively longer petioled, five to seven-foliate; leaflets oblong or oval, sharply toothed, blunt or pointed at the apex, narrowed at the base, 1 to 3 inches long; petioles sheathed at the base by large membranous stipules. Flowers conspicuous, three-fourths to $1\frac{1}{4}$ inches broad; calyx deeply five-lobed with five narrow bractlets,

A. COMMON FIVE-FINGER OR CINQUEFOIL
Potentilla canadensis

B. SILVERWEED; WILD OR GOOSE TANSY
Argentina anserina

A. MEADOWSWEET; QUAKER LADY
Spiraea latifolia

B. DEWBERRY; LOW RUNNING BLACKBERRY
Rubus procumbens

A. HARDHACK; STEEPLEBUSH
Spiraea tomentosa

B. AMERICAN GREAT BURNET
Sanguisorba canadensis

the calyx lobes ovate, acuminate, red or purple within, much exceeding the purple, ovate-lanceolate petals; pistils numerous, seated on an enlarged, pubescent receptacle which becomes spongy in fruit.

In swamps and peat bogs, Greenland and Labrador to New Jersey, Iowa, British Columbia, Wyoming, Alaska and California; also in northern Europe and Asia. Flowering from June to August.

Wild or Scarlet Strawberry

Fragaria virginiana (Linnaeus) Duchesne

Plate 97a

Plants tufted, usually several or many together, dark green, foliage villous-pubescent with spreading hairs. Leaves thick, with three broadly oval or obovate, coarsely toothed leaflets, the terminal one usually narrowed at the base; petioles 2 to 6 inches long. Flowering scapes as long or shorter than the leaves, bearing several white flowers on appressed-pubescent pedicels. Flowers one-half to three-fourths of an inch broad, white, petals obovate. Fruit red, ovoid, the achenes imbedded in pits.

In rather dry soil, fields, hillsides etc., Newfoundland to South Dakota, Florida and Oklahoma. Flowering in April and May.

The European Wood Strawberry (F r a g a r i a v e s c a Linnaeus) is a common escape everywhere in the east and frequently hybridizes with F. v i r g i n i a n a, so that some forms are difficult to classify. The American Wood Strawberry (F r a g a r i a a m e r i c a n a (Porter) Britton), with longer flowering scapes and elongated-conic fruit, with achenes borne on its shining, even surface and but slightly attached to it, is a common species in rocky woodlands. The Northern Wild Strawberry (F r a g a r i a c a n a d e n s i s Michaux) has a long, slender fruit with the achenes sunk in pits and oblong or narrowly obovate leaflets. It ranges across the northern part of the state.

Shrubby Five-finger or Cinquefoil

Dasiphora fruticosa (Linnaeus) Rydberg

Plate 96b

A branching shrub with ascending or erect, leafy branches, 1 to 4 feet high. Leaves pinnate, leaflets five to seven, linear-oblong or oblanceolate, pointed at each end, one-half to 1 inch long, silky-pubescent, the margins entire and revolute; stipules membranous, ovate-lanceolate, entire and pointed. Flowers terminal, in dense or loose cymose clusters, or solitary, bright yellow, three-fourths to $1\frac{1}{4}$ inches broad; the five calyx lobes ovate, with five bractlets; petals five, nearly orbicular and longer than the calyx lobes. Achenes of the fruit covered with long straight hairs.

In swampy or marshy places, often in moist rocky places, Labrador and Greenland to Alaska, south to New Jersey, Illinois, Minnesota, Rocky mountains and California; also in northern Europe and Asia. In northern New England it is often a troublesome, bushy weed. Flowering from June to September.

American Great Burnet

Sanguisorba canadensis Linnaeus

Plate 94b

An erect, leafy, herbaceous plant from a thick, perennial root; stems sometimes decumbent at the base, glabrous or somewhat pubescent below, simple or branched above, 1 to 6 feet high. Leaves odd-pinnate, the lower leaves long petioled, sometimes 1 to $1\frac{1}{2}$ feet long; leaflets seven to fifteen, ovate, oblong or oval, blunt or pointed at the apex; pointed, blunt or even cordate at the base, sharply toothed. Flowers white, in dense terminal spikes, 1 to 6 inches long; petals none; calyx tube turbinate, constricted at the throat, four-winged, four-lobed, the lobes petallike, concave and deciduous; stamens four, their filaments long and white.

In swamps and low meadows, sometimes in bogs, Newfoundland to Michigan, south to Georgia. Flowering from July to September or even later.

ROUGH-FRUITED CINQUEFOIL

Potentilla recta

A. PURPLE OR MARSH CINQUEFOIL; PURPLEWORT
Comarum palustre

B. SHRUBBY FIVE-FINGER OR CINQUEFOIL
Dasiphora fruticosa

A. WILD OR SCARLET STRAWBERRY
Fragaria virginiana

B. DALIBARDA; DEW DROP OR FALSE VIOLET
Dalibarda repens

Common Agrimony

Agrimonia striata Michaux

(*Agrimonia brittoniana* Bicknell)

Plate 98b

Stem rather stout and usually with some straight, nearly erect branches, 2 to 6 feet tall from a perennial fibrous root, pubescent with short, spreading, brownish hairs, somewhat appressed above. Leaves numerous, alternate, compound with seven to nine, or rarely eleven, oblique leaflets, tetragonal-elliptic to rhomboid-lanceolate, pointed and sharply toothed, rather thick and somewhat rough, dull green above, softly pubescent beneath, usually several pairs of small, interposed leaflets; stipules lanceolate, pointed and cut-toothed. Flowers numerous in long, erect or ascending racemes; each flower about one-fourth of an inch wide; petals five, bright yellow; calyx tube in fruit long-turbinate, about one-fourth of an inch long, deeply grooved, unmargined; the bristles numerous, often purplish, short, crowded, inflexed and connivent over the sepals.

Thickets, open woods and roadsides, Newfoundland to Saskatchewan, south to West Virginia, Nebraska and Mexico. Flowering from June to September.

Barren or Dry Strawberry

Waldsteinia fragarioides (Michaux) Trattinnick

Plate 99

A perennial, herbaceous plant resembling a strawberry, with creeping, rather stout rootstock. Leaves tufted, mainly basal, long petioled, glabrous or somewhat pubescent, three-foliate; leaflets obovate, obtuse at the apex, tapering at the base with crenate or sometimes incised margins, 1 to 2 inches long. Flowering scapes slender, erect, bracted, corymbosely three to eight-flowered; pedicels slender, often drooping; flowers yellow, one-half to two-thirds of an inch broad; petals five, obovate and longer than the five ovate-lanceolate, acute calyx lobes; stamens eight, inserted on the throat of the calyx; achenes of the fruit four to six, finely pubescent.

Rocky woods, shaded hillsides and banks, New Brunswick to Ontario, Minnesota, Michigan, Indiana and Oregon. Flowering in May and June.

Yellow Avens; Camproot

Geum strictum Aiton

Plate 98a

Stems erect or nearly so, pubescent, somewhat branched, 2 to 4 feet high, basal leaves lyrate-pinnate with five to seven obovate, cuneate, toothed or lobed leaflets, with a few smaller leaflets interspersed, terminal leaflets largest, broadly ovate or cuneate; stem leaves short petioled or sessile with three to five ovate or oblong, acute segments. Flowers yellow, several, terminal and short peduncled, one-half to three-fourths of an inch broad; petals obovate, exceeding the five calyx lobes. Stamens numerous.

In low, shaded ground, swamps and wet meadows, Newfoundland to British Columbia, south to New Jersey, Pennsylvania, Missouri and New Mexico. Flowering from June to August.

Purple or Water Avens

Geum rivale Linnaeus

Plate 100

Stems simple or nearly so, erect, pubescent, 1 to 3 feet high, from stout perennial roots. Basal leaves lyrately and interruptedly pinnate, petioled, the lateral segments generally few and small, the terminal one to three leaflets much larger, all sharply and irregularly lobed and toothed; stem leaves rather far apart, short petioled or sessile, simple or three-foliated. Flowers few, terminal, purple or purplish, nodding, three-fourths to 1 inch broad; petals obovate emarginate, abruptly narrowed into a claw; calyx lobes spreading, purple; head of the fruit stalked in the calyx; achenes pubescent, style jointed, plumose below, about one-fourth of an inch long.

In swamps and low grounds, Newfoundland to British Columbia, New Jersey, Pennsylvania, Michigan and Colorado; also in northern Europe and Asia. Flowering from early June until the latter part of July.

A. YELLOW AVENS; CAMPROOT
Geum strictum

B. COMMON AGRIMONY
Agrimonia striata

BARREN OR DRY STRAWBERRY

Waldsteinia fragarioides

There are several other Avens in New York, all except G. rivale with reflexed calyx lobes. G. virginianum Linnaeus and G. canadense Jacquin have white flowers. G. vernum (Rafinesque) Torrey & Gray; G. strictum Aiton (described above), and G. meyerianum Rydberg, have yellow flowers. G. macrophyllum Willdenow, a boreal species found only in the Adirondacks, in this State, also has yellow flowers. For complete descriptions of these additional species the student should refer to Gray's Manual or Britton and Brown's Illustrated Flora.

Purple-flowering Raspberry; Thimbleberry

Rubus odoratus Linnaeus

Plate 101

Shrubby, erect and branched, perennial; new growth glandular-pubescent and somewhat bristly but not prickly, 3 to 5 feet high. Leaves simple, petioled, large, 5 to 10 inches broad, three to five-lobed, cordate at the base, pubescent, especially on the veins beneath, the lobes long pointed, the middle lobe usually longer than the others; flowers rather numerous in corymbose, terminal clusters, purple, 1 to 2 inches broad; calyx lobes tipped with long, slender appendages; petals five; fruit red when ripe, broad and thin, scarcely edible.

In rocky woods and thickets, Nova Scotia to Ontario and Michigan, south to Georgia and Tennessee. Flowering from June to August.

New York contains a large number of native raspberries and blackberries. The principal species of Raspberries are R. strigosus Michaux (red); R. neglectus Peck (purple), and R. occidentalis Linnaeus (Black Raspberry). The Blackberries are R. triflorus Richards (Dwarf Red Blackberry), R. canadensis Linnaeus (Northern Blackberry), R. alleghaniensis Porter (Mountain Blackberry), R. argutus Link (Tall Blackberry), and also the Dewberries. See Britton and Brown's Illustrated Flora for complete descriptions.

Dewberry; Low Running Blackberry

Rubus procumbens Muhlenberg

Plate 93b

Stems trailing, shrubby and perennial, often several feet long, armed with numerous or very few prickles. Branches erect, 4 to 12 inches long, slightly pubescent, often prickly and glandular. Leaves three to seven-foliate, usually three-foliate; leaflets ovate or ovate-lanceolate, thin, pointed at the apex, rounded or narrowed at the base, sharply toothed. Flowers few in terminal racemes, white, about 1 inch broad; the five petals usually as long or slightly longer than the calyx lobes. Fruit black, usually at least one-half of an inch long and sometimes 1 inch long, fine flavored but with large seeds.

In dry soil, especially in sandy sections, Nova Scotia to Ontario and Michigan, south to Virginia, Louisiana and Oklahoma. Flowering in May and June. Fruit ripe in June and July.

A similar species, Rubus hispidus Linnaeus (Hispid or Running Swamp Blackberry), with the stems densely beset with weak, retrorse bristles, is also common in swamps and low grounds throughout our area.

Dalibarda; Dewdrop or False Violet

Dalibarda repens Linnaeus

Plate 97b

Stems very slender, much tufted, several inches long. Leaves downy-pubescent on both sides, three-fourths to 2 inches broad, long petioled, ovate-orbicular, cordate, the margin with low, blunt or sometimes mucronulate crenations; stipules setaceous. The scapelike peduncles 1 to 5 inches long, bearing one or two large, perfect white flowers, each flower about one-half of an inch broad; calyx deeply five or six-parted, three of the divisions larger than the other two or three; petals five; stamens numerous. Fruit composed of five to ten nearly dry drupelets, inclosed by the calyx segments. Stems also have short, recurved peduncles bearing several or numerous small cleistogamous flowers.

PURPLE OR WATER AVENS

Geum rivale

PURPLE-FLOWERING RASPBERRY; THIMBLEBERRY

Rubus odoratus

In rich woods, Nova Scotia to Minnesota, south to Pennsylvania, southern New Jersey, North Carolina, Ohio and Michigan. Flowering from June to September.

Low or Pasture Rose

Rosa virginiana Miller

Plate 102

A bushy shrub, a few inches to 3 or 4 feet high, sometimes higher; the stems armed with slender or stout, straight or curved infrastipular spines, and more or less prickly. Stipules entire. Leaves alternate with five or sometimes seven rather thin ovate-oval or obovate leaflets, dull green or somewhat shiny, coarsely toothed, one-half to 2 inches long, usually pointed at the end, glabrous or pubescent beneath. Flowers few or solitary, 2 to 3 inches broad; pedicels and calyx usually glandular; calyx five-lobed, the segments lanceolate, long pointed, sometimes dilated toward the end, spreading and deciduous; petals five, obcordate, rose or pink, fading after opening. Fruit globose or depressed-globose, glandular-hispid, about one-third of an inch high.

In dry or rocky soil, Newfoundland to Ontario and Wisconsin, south to Georgia, Louisiana and Missouri. Flowering from May to July. The Swamp Wild Rose (Rosa carolina Linnaeus) is frequent in open or wooded swamps and marshes.

Apple Family

Malaceae

Black Chokeberry

Aronia melanocarpa (Michaux) Britton

Plate 103

An extensively branching shrub, 3 to 8 feet high. Leaves obovate to oval, the apex varying from blunt to pointed, narrowed or cuneate at the base, short petioled, the margins crenulate, dark green above, paler beneath, glabrous or nearly so when mature. Flowers numerous in terminal, compound, leafy cymes; each flower about one-half of an inch broad; calyx and

pedicels glabrous or nearly so; calyx lobes glandular; petals five, concave, white or tinged with pink, spreading; stamens numerous, filaments rose-colored to white; anthers black or dark red. Fruit globose or oval, nearly black, or purplish black, about one-quarter of an inch in diameter.

In low grounds, swamps or open woods, sometimes in drier situations, Nova Scotia to western Ontario, south to Florida and Michigan. Flowers in April and May. Fruit ripe in August and September.

The Red Chokeberry (A. arbutifolia (Linnaeus) Elliott) has the cymes and lower surface of the leaves woolly and the mature fruit is bright red. The Purple-fruited Chokeberry (A. atropurpurea Britton) also has the cymes and lower leaf surfaces woolly but the mature fruit is purple-black.

Senna Family

Caesalpiniaceae

Wild or American Senna

Cassia marilandica Linnaeus

Plate 104

Stems 3 to 7 feet high, sparingly branched or simple, glabrous or with scant pubescence, from a perennial root. Leaves evenly pinnate, not sensitive to the touch, petioled and with a club-shaped gland near the base of the petiole; leaflets twelve to twenty, oblong, blunt but mucronate at the apex, rounded at the base, ciliate, 1 to 2 inches long, one-fourth to two-thirds of an inch wide. Flowers yellow, about two-thirds to three-fourths of an inch broad, numerous, in pubescent axillary racemes on the upper part of the plant. Calyx lobes five, nearly equal, ovate or oblong, obtuse; corolla nearly regular, of five spreading, nearly equal, clawed petals; stamens ten, the upper three imperfect. Fruit a flat linear pod, 3 to 4 inches long and about one-fourth of an inch wide, curved, pubescent, containing flat, suborbicular seeds. The segments of the pod are about as long as broad.

In moist meadows, marshes and swamps, sometimes on springy hillsides, Massachusetts to central New York, Ohio, Tennessee and North

LOW OR PASTURE ROSE

Rosa virginiana

BLACK CHOKEBERRY

Aronia melanocarpa

Carolina. Rather rare and local in New York, frequently seen along the Hudson River valley and up the Mohawk, northward along West Canada creek to Newport in Herkimer county, which appears to be the northern limit of its range. Flowering in July and August.

Sensitive Pea; Wild Sensitive Plant

Chamaecrista nictitans (Linnaeus) Moenchhausen

Plate 105a

An annual plant, 5 to 16 inches high with erect or decumbent, branching and somewhat pubescent stems. Leaves evenly pinnate, sensitive to the touch, bearing a small gland near the base of the petiole; leaflets twelve to forty, linear-oblong, blunt and mucronate at the apex, rounded and oblique at the base, inequilateral, one-fourth to two-thirds of an inch long, about one-fourth as wide. Flowers two or three together in the axils, one-fourth of an inch broad or less; calyx lobes five, pointed; corolla yellow, somewhat irregular, three of the five petals smaller than the others; stamens five, all perfect. Fruit a small, linear, pubescent or smooth pod, 1 to $1\frac{1}{2}$ inches long.

In dry and sandy soil, Maine to Georgia, west to Indiana, Kansas and Texas. Flowering from July to September.

Partridge Pea; Large-flowered Sensitive Pea

Chamaecrista fasciculata (Michaux) Greene

Plate 105b

Stems annual, rather widely branched and pubescent with spreading hairs or nearly smooth, 1 to 2 feet high. Leaves with a sessile gland on the petiole, sensitive, similar to the preceding species but the twenty to thirty leaflets somewhat larger. Flowers two to four together in the axils, 1 to $1\frac{1}{2}$ inches broad and slender-pediceled; calyx lobes long pointed; petals yellow, sometimes purple spotted; stamens ten, all perfect; four of the anthers yellow, six of them purple. Fruit a linear, pubescent, or glabrous flattened pod, $1\frac{1}{2}$ to $2\frac{1}{2}$ inches long and one-fourth of an inch wide or less.

In dry or sandy soil, Massachusetts to Florida, Minnesota, Texas and Mexico. Flowering from July to September.

Pea Family

F a b a c e a e

Wild Indigo; Horsefly Weed

Baptisia tinctoria (Linnaeus) R. Brown

Plate 107a

Stems glabrous, erect, much branched, 2 to 4 feet high from a perennial root, blackening in dying. Leaves petioled, three-foliate, alternate; leaflets obovate, one-half to $1\frac{1}{2}$ inches long, nearly sessile, blunt, tapering at the base, entire. Flowers bright yellow, rather showy, in numerous, few-flowered, terminal racemes. Each flower about one-half of an inch long; calyx campanulate, the upper two lobes united into a lobe larger than the other three; corolla consisting of a standard (upper petal), two wings (lateral petals), and a keel (two lower petals); stamens ten, distinct; fruit a short ovoid or nearly globose pod, one-fourth to one-half of an inch long, and tipped with the subulate style.

In dry or sandy soil, Maine to Vermont, Ontario, Minnesota, Florida and Louisiana. Flowering from June to September.

The Blue Wild or Blue False Indigo, B a p t i s i a a u s t r a l i s (Linnaeus) R. Brown, has indigo blue flowers nearly an inch long and is naturalized in eastern and southern New York from the south.

Wild or Perennial Lupine

Lupinus perennis Linnaeus

Figure XIX and Plate 106

Stems 8 to 24 inches high, erect, pubescent and often branched, from a perennial root. Leaves digitately compound with seven to eleven (usually about eight), oblanceolate, sessile leaflets, blunt and mucronate at the apex, tapering to the base, 1 to 2 inches long, one-fourth to one-half of an inch wide, appressed-pubescent or glabrate; flowers blue, rarely white or pink, in terminal racemes; each flower one-half to two-thirds of an inch

WILD OR AMERICAN SENNA

Cassia marilandica

A. SENSITIVE PEA; WILD SENSITIVE PLANT
Chamaecrista nictitans

B. PARTRIDGE PEA; LARGE-FLOWERED SENSITIVE PEA
Chamaecrista fasciculata

WILD OR PERENNIAL LUPINE

Lupinus perennis

long, on pedicels one-fourth to one-half of an inch long; calyx two-lipped; standard (upper petal) orbicular with reflexed margins, wings (two lateral petals) obovate; stamens monadelphous, with two forms of anthers. Fruit a linear-oblong, very hairy pod, $1\frac{1}{2}$ to 2 inches long and about one-fourth of an inch wide, with three to six seeds; the two valves of the pod coiling when it dehisces.

In dry, sandy soil, Maine and Ontario to Minnesota, Florida, Missouri and Louisiana. Flowering in May and June. This is the only native species of Lupine in New York, although there are about fifty species in the western states.

Figure XIX
Wild or Perennial Lupine
(Lupinus perennis Linnaeus)

Rabbit-foot, Old Field, or Stone Clover

Trifolium arvense Linnaeus

Plate 108a

An ereet, usually much-branehed annual, 5 to 18 inehes high, silky-pubescent. Leaves very short petioled, three-foliate, oblanceolate or linear, minutely toothed, blunt and sometimes notched at the apex, narrowed at the base, one-half to 1 inch long. Flowers sessile in dense, terminal, peduncled, oblong or eylindric heads, one-half to 1 ineh long; calyx very silky; eorolla whitish, shorter than the elongated, slender, plumose calyx lobes. Fruiting pod very small.

In waste places, dry and sandy fields, roadsides etc., Quebee and Ontario to South Carolina, Florida, Tennessee and Missouri. Naturalized from Europe. Flowering from May to September.

The only Clover native to New York is the Buffalo Clover (T r i f o l i u m r e f l e x u m Linnaeus), which oceurs from the western part of the State westward and southward. Our flora contains a large number of introduced speeies of elovers and related plants. Among them are the following:

Yellow or Hop Clover	T r i f o l i u m	a g r a r i u m
Low or Smaller Hop Clover	"	p r o c u m b e n s
Crimson Clover	"	i n c a r n a t u m
Red or Meadow Clover	"	p r a t e n s e
Alsike or Alsatian Clover	"	h y b r i d u m
White Clover	"	r e p e n s
Alfalfa	M e d i c a g o	s a t i v a
Black or Hop Medic	"	l u p u l i n a
White Sweet Clover	M e l i l o t u s	a l b a
Yellow Sweet Clover	"	o f f i c i n a l i s
Bird's-foot Trefoil	L o t u s	c o r n i c u l a t u s

A. WILD INDIGO; HORSEFLY WEED
Baptisia tinctoria

B. WHITE OR TRUE WOOD SORREL; ALLELUIA
Oxalis acetosella

A. RABBIT-FOOT, OLD FIELD OR STONE CLOVER
Trifolium arvense

B. GOAT'S-RUE; WILD SWEET PEA
Cracca virginiana

Goat's-rue; Wild Sweet Pea

Cracca virginiana Linnaeus

Plate 108b

Stems from a few inches to nearly 2 feet high, few or many in a dense cluster, erect or nearly so, from a stout, perennial root which is elongated, tough and fibrous. Stems and leaves silky with whitish hairs. Leaves odd-pinnate, short petioled; leaflets nine to twenty-five, oblong, linear-oblong or the terminal one oblanceolate, narrowed at the base, rounded and mucronate at the apex or sometimes notched, three-fourths to 1 inch long and one-eighth to one-third of an inch wide. Flowers crowded in a terminal, often compound and nearly sessile racemelike cluster; each flower one-half to three-fourths of an inch long on a short pedicel. Calyx with five nearly equal teeth; petals clawed, the standard rounded, yellow and conspicuous, wings and keel reddish or purplish. Fruiting pod narrow, densely hairy, 1 to 2 inches long.

In dry and sandy soil, Maine to Minnesota, Arkansas, Florida, Louisiana and Northern Mexico. Flowering in June and July or sometimes as late as August in the north.

Coronilla; Axseed; Axwort

Coronilla varia Linnaeus

Plate 109

Stems ascending or straggling, glabrous and usually much branched, 1 to 3 feet long from perennial roots. Leaves sessile; odd-pinnate; leaflets eleven to twenty-five, oblong or obovate, blunt and mucronate at the apex, narrowed or rounded at the base, one-half to three-fourths of an inch long, one-eighth to one-fourth of an inch wide. Flowers numerous in dense umbels terminating peduncles several inches in length; each flower one-third to one-half of an inch long on very short pedicels; standard (upper petal) pink, wings (lateral petals) white or purple-tipped. Fruit pod coriaceous, linear, four-angled, with two or three joints, each about one-fourth of an inch long or slightly longer.

Waste places, fields and roadsides, Massachusetts to southern New York, Maryland and Missouri. Adventive or naturalized from Europe. Flowering from June to August.

THE TICK TREFOILS

Meibomia

The Tick Trefoils are all perennial herbs, often with stout roots, erect, ascending or trailing stems and three-foliolate leaves. The flowers are usually rather small, purplish in terminal or axillary, compound or simple racemes or panicles. Calyx two-lipped, the upper lip two-toothed, the lower lip with three acute or attenuate teeth. Stamens monadelphous or diadelphous (nine and one); anthers all alike. Fruit (loment) flat, sessile or stalked with several joints which are easily separable at maturity.

A large genus of plants with about sixteen representatives in New York State. The following key is given as an aid in placing the various species not fully described and illustrated here.

Loment not constricted above, deeply constricted below, long-stalked; leaflets broad
- Panicle terminal on the leafy stem
  - Leaves crowded at the base of the panicle ..... M. grandiflora
  - Leaves scattered along the stem ..... M. pauciflora
- Panicle arising from the base of the plant, its stalk usually leafless ..... M. nudiflora

Loment constricted on both margins, more deeply below than above
- Stems trailing or reclining
  - Leaflets orbicular, 1 to 2 inches long and pubescent ..... M. michauxii
  - Leaflets ovate or oval, dull green ..... M. glabella
- Stems erect or ascending
  - Leaves sessile or nearly so; leaflets linear or lanceolate ..... M. sessilifolia
  - Leaves petioled
    - Joints of the loment notably longer than broad
      - Leaflets obtuse, yellowish green, rough-pubescent .... M. canescens
      - Leaflets long-acuminate ..... M. bracteosa
    - Joints of the loment little longer than broad
      - Loment distinctly long-stalked in the calyx

CORONILLA; AXWORT; AXSEED

Coronilla varia

Plants glabrous or nearly so (except varieties of M. paniculata)
Leaflets lanceolate or oblong.....M. paniculata
Leaflets broadly ovate or oval, glaucous beneath.....
M. laevigata
Plants pubescent
Leaves velvety-pubescent beneath, thick and coriaceous.....
M. viridiflora
Leaves appressed-pubescent or villous beneath and scarcely coriaceous.....M. dillenii
Loment sessile in the calyx or nearly so
Loment joints four to seven, flowers showy; leaflets not coriaceous..
M. canadensis
Loment joints one to three
Leaflets scabrous, 1 to 2 inches long.....M. rigida
Leaflets not scabrous, one-half to 1 inch long
Plant nearly glabrous throughout..M. marylandica
Stem pubescent; leaflets and petioles ciliate.M. obtusa

Prostrate Tick Trefoil

Meibomia michauxii Vail

Plate 110

Stems prostrate, 2 to several feet long, softly pubescent or villous. Leaves petioled; leaflets nearly orbicular, pubescent, 1 to 2 inches long; stipules triangular-ovate, persistent, pointed, striate. Flowers in loose terminal and axillary panicles, purple, one-fourth to one-half of an inch long; calyx lobes ciliated. Loment about 1 inch long, three to five-jointed, the joints obliquely rhomboid below, slightly concave above, pubescent with hooked hairs, on a stipe about equaling the calyx lobes or slightly longer.

Dry or sandy woods, New England and Ontario to Minnesota, Florida, Missouri and Louisiana. Flowering from July to September.

Large-bracted Tick Trefoil

Meibomia bracteosa (Michaux) Kuntze

Plate 111

Stems erect, 2 to 6 feet high, glabrous or pubescent below, finely pubescent above in the panicle. Leaflets 2 to 8 inches long, longer than the petioles, ovate or ovate-lanceolate, long pointed, smooth or nearly so above, usually pubescent beneath; stipules lanceolate, sharp pointed. Flowers large, purple, one-third to one-half of an inch long with cuspidate, striate, deciduous bracts; calyx deeply two-lipped, the upper lip two-toothed. Loment 1 to 3 inches long, three to seven-jointed, the joints obliquely oblong, about twice as long as wide, pubescent with hooked hairs, on a stipe about as long as the lower calyx lobes.

In open woods and thickets, Maine to Ontario, Minnesota, Florida, Missouri, Arkansas and Texas. Flowering in August and September.

Dillen's Tick Trefoil

Meibomia dillenii (Darlington) Kuntze

Plate 112

Stems erect, pubescent with scattered hairs, 2 to 3 feet high. Leaflets rather thin, oval or oblong-ovate, blunt, $1\frac{1}{2}$ to 4 inches long, one-half to $1\frac{1}{2}$ inches wide, sparingly pubescent or glabrous above, softly pubescent beneath; petioles much shorter than the leaflets. Flowers one-fourth to one-third of an inch long, purple, in loose, terminal, compound racemes with small, deciduous bracts. Loment 1 to 2 inches long, two to four-jointed, the joints nearly triangular, about one-fourth of an inch long, slightly convex on the back, pubescent with hooked hairs, with a stipe shorter than the calyx lobes.

In woods and thickets, Maine to Ontario, Minnesota, Alabama, Tennessee, Missouri and Texas. Flowering from the last of June to September.

PROSTRATE TICK TREFOIL

Meibomia michauxii

LARGE-BRACTED TICK TREFOIL

Meibomia bracteosa

DILLEN'S TICK TREFOIL

Meibomia dillenii

THE BUSH CLOVERS

Lespedeza

Herbs, often with perennial roots and erect or ascending stems. In a few species the stems trailing. Leaves three-foliolate. Flowers small, purple or whitish, in axillary clusters, heads or panicles. Frequently the flowers are of two kinds intermixed, one petaliferous but sterile, the other minute, apetalous and fertile. Calyx lobes nearly equal, those of the petaliferous flowers usually longer than those of the apetalous flowers. Upper petal (standard) obovate or oblong, the lower petals forming an incurved keel. Stamens usually diadelphous (nine and one); anthers all alike. Ovary one-ovuled, ripening into a flat, indehiscent, reticulated, mostly one-jointed and one-seeded pod.

Key to the New York Species of Lespedeza

Corolla purple or purplish; plants bearing both petaliferous and apetalous flowers
- Stems prostrate or trailing
  - Foliage glabrous or somewhat appressed-pubescent ..... L. repens
  - Foliage downy-pubescent or tomentose ..... L. procumbens
- Stems erect or ascending
  - Peduncles distinct and mostly longer than the leaves
    - Bushy-branched; petaliferous flowers paniculate ..... L. violacea
    - Stems simple or little branched; flowers racemose or subspicate
      - Stems tomentose; leaves tomentose beneath ..... L. brittonii
      - Stems and leaves glabrate or appressed-pubescent; leaflets oval to suborbicular ..... L. nuttallii
  - Peduncles shorter than the leaves or the flower clusters sessile
    - Leaflets densely tomentose beneath; calyx of the petaliferous flowers less than one-half as long as the pod ..... L. stuvei
    - Leaflets appressed pubescent beneath or glabrate
      - Calyx of petaliferous flowers less than one-half as long as the pod; leaflets oval to oblong ..... L. frutescens
      - Calyx of the petaliferous flowers two-thirds as long as the pod or more; leaflets silvery-pubescent beneath ..... L. simulata

Corolla whitish or yellowish; flowers all complete; pod included or scarcely exserted from the calyx

Leaflets oblong, ovate-oblong, or nearly orbicular

Peduncles mostly exceeding the leaves.....L. hirta

Peduncles shorter than the leaves.....L. capitata

Stuve's Bush Clover

Lespedeza stuvei Nuttall

Plate 113b

Stems erect or nearly so, simple and wandlike or slightly branched, densely velvety or downy-pubescent all over, 2 to 4 feet high; petioles as long as the leaves or usually shorter; leaflets oval, oblong or suborbicular, blunt or retuse at the apex, one-half to 1 inch long. Flowers of both kinds in nearly sessile, axillary clusters; corolla violet-purple, one-fourth of an inch long or less. Pod oblong-ovate to orbicular, pointed, about one-fourth of an inch long or less, downy-pubescent, much longer than the calyx.

In dry or sandy soil, Vermont and Massachusetts to Virginia, Alabama, Michigan, Arkansas and Texas. Flowering in August and September.

Wandlike Bush Clover

Lespedeza frutescens (Linnaeus) Britton

Plate 114

Stems erect, 1 to 3 feet high, simple or somewhat branched, finely pubescent or nearly smooth; petioles as long as the leaflets or shorter; leaflets oval, oblong or elliptic, blunt, truncate or notched at the apex, narrowed or rounded at the base, one-half to $1\frac{1}{2}$ inches long, smooth and dark green above, paler and pubescent beneath. Flowers of both kinds in short-stalked axillary clusters which are more or less crowded toward the summit of the stem; corolla violet-purple, about one-fourth of an inch long; pod ovate, pointed, pubescent, about one-fifth of an inch long.

Dry soil in open woods, old fields, etc., Maine to Ontario, Minnesota, Florida, Illinois and Texas. Flowering in August and September.

A. HAIRY BUSH CLOVER
Lespedeza hirta

B. STUVE'S BUSH CLOVER
Lespedeza stuvei

WANDLIKE BUSH CLOVER

Lespedeza frutescens

Hairy Bush Clover

Lespedeza hirta (Linnaeus) Hornemann

Plate 113a

Stems rather stiff, erect and usually stout, simple or branched above, densely hairy or softly pubescent, 2 to 5 feet high. Leaflets three, oval or suborbicular, blunt at each end, or often notched at the apex, one-half to 2 inches long; the petioles shorter than the leaflets. Flowers in oblong-cylindric, rather dense heads on stalks which are much longer than the leaves; flowers all complete; corolla yellowish white, usually the standard with a purple spot near its base. Fruiting pod oval, pointed, hairy and about as long as the slender calyx lobes.

In dry or sandy soil, Maine to Ontario and Minnesota, south to Florida, Louisiana and Texas. Flowering from August to October.

The Round-headed Bush Clover (Lespedeza capitata Michaux) is similar but the stalks bearing the flower clusters are shorter than the leaves, forming a more compact inflorescence. Its range and period of flowering are about the same.

Beach Pea; Seaside Pea

Lathyrus maritimus (Linnaeus) Bigelow

Plate 115

Root perennial, stem glabrous or nearly so, stout, somewhat fleshy and slightly glaucous, angled, decumbent, 1 to 2 feet long with broad foliaceous, hastate, pointed stipules 1 to 2 inches long. Leaves nearly sessile, pinnate, the rachis terminating in a slender, forked tendril; leaflets six to twelve, oblong, oval or obovate, blunt and mucronulate at the apex, usually narrowed at the base, 1 to $2\frac{1}{2}$ inches long, one-half to three-fourths of an inch wide. Flowers six to ten on peduncles 3 to 4 inches long, purple, three-fourths to 1 inch long; calyx teeth often ciliate. Fruit a sessile, linear-oblong, nearly glabrous, veined pod, $1\frac{1}{2}$ to 3 inches long and about one-half of an inch wide.

Sea beaches and sandy fields near the coast, New Jersey to Arctic America, also Oneida lake, Great Lakes, Pacific coast and in northern Europe and Asia. Flowering from May to August.

Myrtle-leaved Marsh Pea

Lathyrus myrtifolius Muhlenberg

Plate 116

Stems very slender, smooth, angled but not winged, weak, 1 to 3 feet long with obliquely ovate or half-sagittate stipules, one-half to 1 inch long, one-third to one-half of an inch wide and toothed; leaflets usually six, varying from four to eight, oval or ovate, pointed and mucronate at the apex, narrowed at the base, three-fourths to 2 inches long, one-fourth to two-thirds of an inch wide, the rachis terminating in a forked tendril. Flowering peduncles as long as the leaves or shorter, with three to nine flowers, yellowish in bud but turning purple as the flower opens; each flower about one-half of an inch long. Fruit a narrow, smooth pod without visible stalk, 1 to 2 inches long and somewhat less than one-fourth of an inch wide.

In moist thickets, wet ground, swamps and shores, New Brunswick to Manitoba, south to North Carolina and Tennessee. Flowering from late in May until June or July.

The members of the genus Lathyrus are often called Vetchlings, because of their close relationship to the true Vetches (genus Vicia), most of which are cultivated or naturalized species in our State. Another native Vetchling is the Marsh Vetchling (L a t h y r u s p a l u s t r i s Linnaeus), a boreal species found in the northern part of the State. It has linear leaflets and the stems are usually winged. The flowers are purple. The Cream-colored Vetchling (L a t h y r u s o c h r o l e u c u s Hooker) with rather large cream-colored flowers, and broadly oval, acute leaflets, occurs throughout the western part of the State.

BEACH PEA; SEASIDE PEA

Lathyrus maritimus

MYRTLE-LEAVED MARSH PEA

Lathyrus myrtifolius

Groundnut; Wild Bean

Glycine apios Linnaeus

Plate 117

Stems slender, hairy or nearly smooth, with milky juice, climbing over herbs and bushes to a height of several feet, from a perennial root-stock of several necklace-shaped, edible tubers. Leaves pinnately compound, five- to seven-foliolate; leaflets ovate to ovate-lanceolate, pointed at the apex, rounded at the base, 1 to 3 inches long. Flowers brownish purple, fragrant, about one-half of an inch long, in axillary racemes; peduncles shorter than the leaves; rachis of the inflorescence knobby; calyx two-lipped, the two lateral teeth very small, the two upper united and short, the lower one long and acute; standard ovate or orbicular and reflexed, wings obliquely obovate, adherent to the elongated, incurved and at length twisted keel; pod narrow, straight or slightly curved, 2 to $4\frac{1}{2}$ inches long and about one-fourth of an inch wide or less, many-seeded and rather thick in texture.

Moist thickets along streams, bottomlands, or low woods. New Brunswick to Florida, west to Ontario, Minnesota, Nebraska, Kansas and Texas. Flowering from July to September.

Wild or Hog Peanut

Falcata comosa (Linnaeus) Kuntze

Plate 118a

Stems very slender, simple or somewhat branched, twining and climbing over herbs and shrubs, 1 to 6 feet long, more or less pubescent. Leaves with three rhombic-ovate or broadly ovate leaflets pointed at the apex, rounded at the base, 1 to 3 inches long. Flowers purplish or nearly white in axillary, slender-stalked clusters or racemes. In the lower axils are solitary, apetalous, fertile flowers. Calyx of the petaliferous flowers four to five-toothed, tubular; the oblong wings of the corolla curved and adherent to the recurved, blunt keel and inclosed by the erect,

obovate standard; pods oblong-lanceolate, pointed and hairy, about 1 inch long.

In moist, shaded places, New Brunswick to Florida, west to Manitoba, Nebraska and Louisiana. Flowering from early in August until late in September.

Falcata pitcheri (Torrey & Gray) Kuntze, very closely related to the preceding species, has leaves of a firmer texture and the stems, petioles and flowering stalks villous-pubescent with conspicuous brown hairs.

Trailing Wild Bean

Strophostyles helvola (Linnaeus) Britton

Plate 118b

A twining or trailing and climbing, herbaceous, rough-pubescent vine. Stems more or less branched below, 2 to 7 feet long, or dwarfed and almost erect, from an annual root. Leaves pinnately three-foliolate; leaflets ovate, pointed or blunt at the apex, the base rounded, thickish in texture, usually bluntly lobed, 1 to 2 inches long, the two lower leaves unequal at the base. Flowers greenish purple, about one-half of an inch long, three to twelve together in dense, capitate clusters at the ends of long, axillary stalks which are longer than the leaves; keel of the corolla strongly curved and slender. Fruiting pod round in cross-section, somewhat hairy, linear and without a stalk, $1\frac{1}{2}$ to 3 inches long.

In sandy fields and thickets, mainly near the coast, Quebec to Massachusetts and Florida, less frequent westward through Ontario to South Dakota and Kansas. Flowering from the latter part of July to September and October.

A closely related species of Long Island and southward, S. umbellata (Muhlenberg) Britton, has shorter pods, slightly larger flowers, entire leaflets and perennial roots.

GROUNDNUT; WILD BEAN

Glycine apios

A. WILD OR HOG PEANUT
Falcata comosa

B. TRAILING WILD BEAN
Strophostyles helvola

Geranium Family

Geraniaceae

Herb Robert; Red Robin

Robertiella robertiana (Linnaeus) Hanks

(*Geranium robertianum* Linnaeus)

Plate 119

Roots mostly biennial, sometimes annual, giving rise to one or several ascending or nearly erect, glandular-pubescent stems 5 to 18 inches high. Entire plant with a strong, disagreeable odor. Leaves rounded-ovate in outline, the divisions deeply cleft or lobed, the margins with oblong, mucronate teeth. Flowers reddish purple, about one-half of an inch broad, two on each stalk; sepals five, each tipped with an awn. Petals five, each with a slender claw and an obovate, rounded blade. Stamens ten; ovary five-lobed and five-celled. Fruiting capsule about 1 inch long, awn-tipped, separating at maturity into five carpels, the bodies deciduous from the styles at maturity, each with two fibrous appendages near the top.

In rich soil of rocky woodlands, Nova Scotia to Manitoba south to Pennsylvania and Missouri; also in Europe and Northern Africa. Flowering from May to September.

Wild Geranium; Wild or Spotted Crane's-bill

Geranium maculatum Linnaeus

Plate 120

Stems mainly simple from a stout, perennial rootstock, often much branched above, hairy, 10 to 20 inches high. The basal leaves nearly orbicular, broadly heart-shaped, on long leaf-stalks; the blades 3 to 5 inches wide, deeply three to five-lobed with wedge-shaped divisions, the margins cleft or toothed; leaves of the stem two, opposite, short-stalked, similar to the basal leaves. Flowers rose-purple, 1 to $1\frac{1}{2}$ inches broad, terminal in two to five-flowered, loose, leafy-bracted umbels; sepals sharp pointed; petals five, woolly at the base, thin, broad and overlapping one another. Fruit an elongated capsule tipped with the persistent compound style,

which in fruit is 1 or more inches long; carpels of the fruit permanently attached to the styles, separating from the base and curved upward in dehiscence.

In rich or moist woodlands, Maine and Ontario west to Manitoba, south to Georgia and Alabama. Flowering from late in April to June or July.

There are several other species of Geranium in New York, most of them small-flowered, introduced species. Of the native ones, Bicknell's Geranium (Geranium bicknellii Britton) is an annual with small, purple flowers, somewhat less than one-half of an inch broad in a loose cluster, on two-flowered peduncles, with the beak of the fruit long pointed. The Carolina Geranium (Geranium carolinianum Linnaeus) has a more compact inflorescence and a short-pointed fruit.

Wood Sorrel Family

Oxalidaceae

White or True Wood Sorrel; Alleluia

Oxalis acetosella Linnaeus

Plate 107b

Rootstock perennial, slender, scaly and little branched. Leaves basal, three to eight together, each 2 to 6 inches high, pubescent; petioles broadened at the base and jointed. Leaflets three, obcordate, wider than long, one-half to 1 inch wide. Flowers one-half to three-fourths of an inch broad, solitary on stalks as long or longer than the leaves; petals white or pink with deep pink veins, three or four times longer than the calyx; stamens ten. Fruit a subglobose, cylindric capsule about one-sixth of an inch long. At the base of the leaves are also found short-stalked flowers.

In cool, damp woods, or shaded mossy banks, Nova Scotia to the north shore of Lake Superior, south to North Carolina. Also in Europe, Asia and northern Africa. Flowering from May to July.

HERB ROBERT; RED ROBIN

Robertiella robertiana

WILD GERANIUM; WILD OR SPOTTED CRANE'S-BILL

Geranium maculatum

Violet Wood Sorrel

Ionoxalis violacea (Linnaeus) Small

Plate 121a

Flowering stalks and leaves smooth, 3 to 8 inches tall, arising from a perennial, brownish, scaly bulb. Leaves few or several, slender-stemmed, one-half to $1\frac{1}{4}$ inches wide. Leaflets three, broader than long, notched at the apex. Flowers three to ten, or rarely more on each stalk, forming a loose, umbellate inflorescence at the summit, which is taller than the leaves. Each flower two-thirds to three-fourths of an inch long on a short, slender pedicel; sepals blunt, five in number, with tubercles at the apex; petals five, rose-purple, lighter toward the base, blunt, about three times as long as the sepals; stamens ten; capsule ovoid, about one-fifth of an inch in diameter.

In open, usually rather dry woodlands, shaded hillsides and thickets; sometimes in open, recently cleared land, Massachusetts to Florida and Texas, west to Minnesota. Flowering in May and June.

Tall Yellow Wood Sorrel

Xanthoxalis cymosa Small

Plate 121b

Stems ascending or erect, branched above, 6 inches to 3 or 4 feet high and frequently reclining on surrounding vegetation, usually hairy, reddish or brown. Leaves bright green, three-fourths to $1\frac{1}{2}$ inches broad on petioles 1 to 3 inches long; leaflets broader than long, sharply notched. Flowers yellow, in forking cymes; each flower on a pedicel one-fourth to one-third of an inch long, which is more or less hairy and erect or ascending. Sepals five, lanceolate or narrowly elliptic, one-sixth to one-fourth of an inch long, spreading in fruit; petals five, obtuse or notched at the apex, one-third to nearly one-half of an inch long. Fruit a slender, columnar, erect capsule, about one-half of an inch long, gradually narrowed to the summit; seeds obovoid-oblong with nearly continuous ridges.

In fields, thickets and woods, Ontario to Michigan, south to Florida and Texas. Flowering from May to October.

There are several closely related species of Yellow Sorrel. Those of the northeastern states are illustrated and described by Britton & Brown (Illus. Flora, 2: 432–35, ed. 2) (X. stricta, X. bushii, X. rufa and X. brittoniae).

Jewelweed Family

Balsaminaceae

Spotted or Wild Touch-me-not

Impatiens biflora Walter

Plate 122a

A tall, glabrous annual, 2 to 6 feet high and much branched, more or less purplish. Leaves alternate, thin, ovate and elliptic, glaucous beneath, 1 to 3 inches long, blunt, the margins toothed. Flowers horizontal, orange-yellow, mottled with reddish brown, or rarely nearly white and not mottled, three-fourths to 1 inch long, on slender, pendant stalks. Sepals three, the two lateral ones small, green, nerved, the other one large, conic, petallike, saccate and spurred, longer than broad, contracted into a slender incurved spur, two-toothed at the apex. Petals three, with two of them two-cleft into dissimilar lobes; stamens five. Fruit an oblong capsule, violently and elastically dehiscent at maturity into five spirally coiled valves, expelling the oblong, ridged seeds. Also developing small, cleistogamous flowers later in the season.

Low grounds, thickets, ditches, along streams and low, moist woodlands, Newfoundland to Saskatchewan, south to Florida and Nebraska. Flowering from July to September.

Pale Touch-me-not; Jewelweed

Impatiens pallida Nuttall

Plate 122b

Resembling the Spotted Touch-me-not, but usually stouter and higher. Flowers pale yellow, sparingly spotted with reddish brown or without spots, 1 to $1\frac{1}{2}$ inches long, the saccate sepal dilated-conic, as broad as long, abruptly contracted into a short, scarcely incurved spur, which is less than one-third the length of the saccate sepal.

A. VIOLET WOOD SORREL
Ionoxalis violacea

B. TALL YELLOW WOOD SORREL
Xanthoxalis cymosa

A. SPOTTED OR WILD TOUCH-ME-NOT
Impatiens biflora

B. PALE TOUCH-ME-NOT; JEWELWEED
Impatiens pallida

In situations similar to the preceding species but more common northward, Nova Scotia to Saskatchewan, south to Georgia and Kansas. Flowering from July to September.

Milkwort Family

Polygalaceae

A family of small herbs (our species) with alternate, opposite or whorled leaves. Flowers racemose, spicate or capitate, rarely solitary and axillary, sometimes also with cleistogamous and subterranean flowers. Sepals very unequal, the two lateral ones large and petallike. Petals three, united into a tube which is split on the back, and more or less adnate to the stamens. Stamens eight or six, monadelphous below, or diadelphous. Capsule membranaceous, compressed, dehiscent along the margin. Seeds one in each cavity of the capsule and usually hairy.

Our species all belong to Polygala, a very large genus of plants, containing about sixty species in North America, of which about eleven are found in New York State. The following key may be of service in identifying them.

Flowers orange-yellow in a dense oblong spike; basal leaves spatulate.....1 P. lutea
Flowers rose or purple, distinctly racemose.....2 P. polygama
Flowers rose-purple to white, one to four in number, axillary, but apparently terminal....
3 P. paucifolia
Flowers in terminal, more or less elongated spikes, or if the spikes oblong, flowers not yellow and no basal leaves
Leaves at least the lower, verticillate, spikes 4 to 9 lines thick, blunt; flowers purple to greenish white
Spikes sessile or nearly so; wings deltoid.....4 P. cruciata
Spikes peduncled; wings lanceolate-ovate.....5 P. brevifolia
Leaves verticillate and alternate; spikes 2 to 3 lines thick and acute
Verticillate leaves predominating; spikes dense; flowers green to purplish.....
6 P. verticillata
Alternate leaves predominating; spikes loose; flowers more purple.....
7 P. ambigua

Leaves all alternate

Petals united into a tube which is cleft and about one-fourth of an inch long; flowers pink ..... 8 P. incarnata

Petals not conspicuously united into a tube

Spikes ovoid to globose; bracts persistent; flowers rose-purple to white ..... 9 P. viridescens

Spikes cylindric

Leaves oblanceolate to linear, 2 to 6 lines long; flowers greenish to purplish ..... 10 P. nuttallii

Leaves lanceolate, 1 to 2 inches long; flowers white to greenish ..... 11 P. senega

Orange Milkwort; Wild Bachelor's-button

Polygala lutea Linnaeus

Plate 123a

Stems annual, smooth, tufted from fibrous roots, creet or ascending, sometimes becoming branched, 6 to 12 inches high. Stem leaves oblong-lanceolate, pointed or blunt, three-fourths to $1\frac{1}{2}$ inches long, one-fourth of an inch wide or less, entire; basal leaves broader and usually larger, obovate or spatulate, blunt. Flowers in terminal, blunt, spikelike racemes which are dense and ovoid or oblong in shape, one-half to $1\frac{1}{2}$ inches long, one-half to three-fourths of an inch thick. Individual flowers about one-fourth of an inch long, orange-yellow, preserving their color in drying; wings oblong-ovate, abruptly pointed; crest of the corolla tube minute; caruncle lobes linear, about equaling the hairy seed, or shorter.

In pine-barren depressions and swamps, Long Island to New Jersey and eastern Pennsylvania to Florida and Louisiana. Flowering from June to August or September.

Cross-leaved or Marsh Milkwort

Polygala cruciata Linnaeus

Plate 123b

A small annual, 3 to 15 inches tall, with three or four alternate branches above, the stems angled or square. Leaves all on the stem and mostly

A. ORANGE MILKWORT; WILD BACHELOR'S-BUTTON
Polygala lutea

B. CROSS-LEAVED OR MARSH MILKWORT
Polygala cruciata

A. FIELD OR PURPLE MILKWORT
Polygala viridescens

B. RACEMED MILKWORT
Polygala polygama

verticillate in fours, oblaneeolate or linear-laneeolate, one-half to $1\frac{1}{2}$ inches long and about one-eighth of an ineh wide, entire, blunt and mueronulate at the apex. Flowers in short-stalked, oval, blunt raeemes, about one-third to one-half of an ineh thiek, purplish green or nearly white; wings triangular-ovate, sessile, somewhat heart-shaped, pointed or awned, one-fourth of an ineh long or less, longer than the pods; crest of the eorolla minute; seeds oblong and somewhat hairy.

In low grounds and marshes along the eoast and sandy swamps inland, Maine to Florida west to Miehigan, Minnesota, Nebraska and Louisiana. Flowering from July to September.

Field or Purple Milkwort

Polygala viridescens Linnaeus

Plate 124a

Stems leafy, branehed above, annual, smooth and somewhat angled, 5 to 15 inehes high. Leaves all on the stem, oblong to linear-oblong in shape, three-fourths to $1\frac{1}{2}$ inehes long, one-eighth or one-sixteenth of an ineh wide, pointed and mucronulate. Flowers purplish, greenish purple, whitish or greenish in terminal, globose, blunt heads about one-half of an ineh thiek, becoming oval; wings of the flowers sessile, ovate, often slightly eordate, longer than the pod, braets usually persistent on the elongating axis as the lower flowers fall away.

In meadows, fields and sandy depressions, Nova Seotia to Ontario and Minnesota, south to North Carolina, Kansas and Arkansas. Flowering from June to September.

Seneca Snakeroot; Mountain Flax

Polygala senega Linnaeus

Plate 125a

Stems usually several from a perennial, woody rootstoek, ascending or ereet, 5 to 18 inehes high, usually simple, oeeasionally branehed above, glabrous or nearly so. Leaves alternate, the lowest ones very small, closer together and sealelike, the upper ones oblong-laneeolate or ovate, some-

times lanceolate, sessile, 1 to 2 inches long, about one-fourth to one-third of an inch wide, minutely toothed. Flowers white, sometimes tinged with green, in dense, terminal, pointed spikes, 1 to 2 inches long. Each flower about one-eighth of an inch long; wings of the flower orbicular-obovate, concave; crest of the corolla short and few-lobed.

In dry or rocky woodlands, New Brunswick to Hudson bay and Alberta, south along the mountains to North Carolina and west to Missouri and Arkansas. Flowering in May and June.

Racemed Milkwort

Polygala polygama Walter

Plate 124b

Stems usually several or many from a deep, slender, perennial root, smooth and simple, 4 to 15 inches high. Leaves crowded along the stems, oblong or broadly lanceolate, blunt, mucronulate, two-thirds to 1 inch long and about one-sixth of an inch wide or less, the lower leaves usually smaller. Flowers purple, rarely whitish, in a loose, terminal raceme, 1 to 3 inches long or less; wings of the flower broadly ovate; crest of the corolla large and fringed; stamens eight. Numerous cleistogamous flowers are developed upon conspicuous, whitish subterranean branches which rise from the base of the stems.

In dry or sandy fields and meadows, Nova Scotia to Manitoba, south to Florida, Texas and Michigan. Flowering in June and July.

Fringed Milkwort; Flowering Wintergreen

Polygala paucifolia Willdenow

Plate 125b

Flowering and leaf-bearing stems smooth, ascending or erect, 3 to 7 inches high from slender, prostrate, perennial stems and rootstocks which are often several inches in length. Leaves few, clustered at the summit of the stems, ovate or oblong, 1 to $1\frac{1}{2}$ inches long, two-thirds to 1 inch wide, pointed at each end, rough-margined. Flowers one to five on a stem, axillary to the upper leaves, rose-purple or rarely white, two-thirds to

A. SENECA SNAKEROOT; MOUNTAIN FLAX
Polygala senega

B. FRINGED MILKWORT; FLOWERING WINTERGREEN
Polygala paucifolia

1 inch long on slender, short flower stalks; wings of the flower obovate; crest of the corolla beautifully fringed. The base of the stems and root-stocks bear numerous cleistogamous flowers on short, lateral, subterranean branches.

In rich, moist woods, New Brunswick to Saskatchewan south to Georgia, Illinois and Minnesota. Flowering in May and June.

Buckthorn Family

Rhamnaceae

New Jersey Tea; Redroot

Ceanothus americanus Linnaeus

Plate 126

A low shrub with several or many ascending stems from a deep reddish root. Leaves alternate, ovate or oblong-ovate, 1 to 3 inches long, one-half to 1½ inches wide, pointed at the apex, blunt or slightly heart-shaped at the base, pubescent, especially beneath, the margins finely toothed, the blade conspicuously three-nerved; petioles usually less than one-half of an inch long. Flowers small and white, in dense, oblong clusters on terminal or elongated axillary stalks; limb of the calyx tube five-lobed; petals five, with narrow claws and bearded blades; stamens five, their filaments slender and elongated. Fruit dark colored or nearly black when mature, three-lobed, about one-sixth of an inch long.

In sandy or dry open woods and fields, Maine to Ontario and Manitoba south to Florida and Texas. Flowering from the latter part of May to July.

Mallow Family

Malvaceae

Marsh Mallow; Wymote

Althaea officinalis Linnaeus

Plate 127

An introduced plant, well established in certain salt marshes along the coast, with erect, herbaceous stems, 2 to 6 feet high from perennial roots,

densely velvety-pubescent all over. Leaves ovate, pointed or blunt at the apex, toothed and usually somewhat three-lobed, the lower leaves usually cordate, veins conspicuously raised on the lower surfaces. Flowers pink or nearly white, about $1\frac{1}{2}$ inches broad in terminal and axillary leafy clusters. Calyx segments five, ovate-lanceolate, subtended by six to nine linear bractlets; petals five; stamens numerous, forming a central column around the pistil and united with the bases of the petals; styles united below. Carpels fifteen to twenty, each one-seeded, arranged in a circle around the axis of the fruit.

Flowering in June and July. The photograph for the illustration of this species was taken near Port Washington, Long Island.

Musk Mallow; Musk Plant

Malva moschata Linnaeus

Plate 128

Stems erect, 1 to $2\frac{1}{2}$ feet high, more or less branching and hairy, from a perennial root. Leaves orbicular in outline, 3 to 4 inches broad with several broad, rounded, toothed lobes; stem leaves deeply cut into narrow segments. Flowers $1\frac{1}{2}$ to 2 inches broad, pink or white, slightly musk-scented, clustered in leafy racemes at the summits of the stems and branches; petals five, notched at the apex, several times longer than the pointed, triangular-ovate calyx lobes; stamens numerous, forming a column in the center of the flower; carpels of the fruit fifteen to twenty in number, densely hairy, rounded at the back.

Roadsides, fields and waste places throughout the eastern states. Native of Europe and thoroughly naturalized in many places. Flowering from July to September.

Other Mallows, native of the Old World and adventive or naturalized in the eastern states, are the High Mallow (Malva sylvestris Linnaeus), the Low, Dwarf or Running Mallow, also known as Cheeses (Malva rotundifolia Linnaeus), the Whorled Mallow or Curled Mallow (Malva verticillata Linnaeus) and the Vervain Mallow

NEW JERSEY TEA; REDROOT

Ceanothus americanus

MARSH MALLOW; WYMOTE

Althaea officinalis

MUSK MALLOW; MUSK PLANT

Malva moschata

(Malva alcea Linnaeus). Descriptions of these may be found in the current floras or manuals of botany of the northeastern states.

Swamp Rose Mallow; Mallow Rose

Hibiscus moscheutos Linnaeus

Plate 129

Stems tall and canelike from a perennial root, 3 to 6 feet high. Leaves ovate-lanceolate or ovate, blunt or rounded and often slightly heart-shaped at the base, pointed or blunt at the apex, 3 to 5 inches long, the lower ones sometimes lobed, all conspicuously palmately veined, toothed, densely hairy with white stellate hairs beneath, green and finely hairy or nearly smooth above. Flowers 4 to 7 inches broad, pink, clustered at the top of the plant; calyx lobes five, ovate, pointed, subtended by several narrow bractlets; petals five, broadly obovate; stamens numerous in a column surrounding the style which is five-cleft at the summit with five stigmas. Fruit a five-chambered pod about 1 inch long, blunt or slightly pointed.

In marshes along the ocean or near the coast from eastern Massachusetts to Florida and in saline situations and marshy lake shores inland, especially throughout the Great Lakes region. Flowering in August and September.

The Crimson-eye Rose Mallow (Hibiscus oculiroseus Britton) is similar, but the flower is white with a dark-crimson center and the fruit pod is long pointed. It is found on Long Island, Staten Island and in New Jersey.

Saint John's-wort Family

Hypericaceae

A family containing about sixteen species in New York State, mostly herbs, some of them shrubs, chiefly with opposite leaves and yellow or rarely reddish flowers in terminal clusters. In many of them the foliage is pellucid-punctate or dotted. Flowers regular and perfect. Sepals four or five. Petals four or five. Stamens numerous or few, often in three or five sets.

Key to the New York State Species of the Saint John's-wort Family

Sepals four, in unequal pairs; petals also four

Stems erect, 1 to 2 feet high; leaves clasping, styles three to four. 1 Ascyrum stans

Stems diffusely branched, 5 to 10 inches high; leaves sessile; styles two. 2 Ascyrum hypericoides

Sepals and petals usually five

Petals pink or greenish purple, imbricated in the bud; leaves sessile; capsules red-purple. 3 Triadenum virginicum

Petals yellow, convolute in the bud

Leaves reduced to minute appressed scales. 4 Sarothra gentianoides

Leaves normal

Styles five, large perennials

Flowers 1 to 2 inches broad; capsules three-fourths of an inch long. 5 Hypericum ascyron

Flowers one-half to 1 inch broad; capsules about one-half of an inch long. 6 Hypericum kalmianum

Styles three or rarely four

Tall leafy shrubs with numerous flowers

Flowers one-half to three-fourths of an inch broad; pods one-third to one-half of an inch long. 7 Hypericum prolificum

Flowers one-third to one-half of an inch broad; pods one-sixth to one-fourth of an inch long. 8 Hypericum densiflorum

Herbaceous perennials, or woody at the base only

Stamens numerous (fifteen to forty); flowers one-fourth to 1 inch broad

Capsules one-celled or incompletely three to four-celled

Capsules incompletely three to four-celled by the projecting placentae; leaves oblong. 9 Hypericum adpressum

Capsules strictly one-celled; placentae parietal; styles united into a beak, separate above; leaves elliptic. 10 Hypericum ellipticum

Capsules completely three-celled; styles separate

Leaves linear or oblong; sepals lanceolate. Introduced from Europe. 11 Hypericum perforatum

SWAMP ROSE MALLOW; MALLOW ROSE

Hibiscus moscheutos

Leaves broadly oblong, oval or ovate-lanceolate, native; sepals ovate to ovate-lanceolate, acute.....
12 Hypericum punctatum
Stamens few (five to twelve); flowers one-tenth to one-fourth of an inch broad
Cyme leafy-bracted .....13 Hypericum boreale
Cymes subulate-bracted
Leaves ovate, oval or oblong; capsules one-twelfth to five-twelfths of an inch long.....
14 Hypericum mutilum
Leaves lanceolate or oblong-lanceolate; capsule one-third to one-half of an inch long.....
15 Hypericum majus
Leaves linear, blunt, three-nerved.....
16 Hypericum canadense

Great or Giant Saint John's-wort

Hypericum ascyron Linnaeus

Plate 130a

Stems herbaceous, 2 to 5 feet tall from a perennial root, angled, branching and smooth. Leaves sessile, ovate-oblong to ovate-lanceolate, 2 to 5 inches long and three-fourths to 1½ inches wide, clasping the stem. Flowers bright yellow, showy, 1 to 2 inches broad, few or several in a loose, terminal cluster. Sepals five, ovate-lanceolate, about one-half of an inch long, pointed; petals five, obovate or oblanceolate; stamens numerous, united into five sets. Styles usually five in number, united below, the stigmas capitate. Fruit pod ovoid in shape, three-fourths to seven-eighths of an inch long.

Chiefly along streams, Quebec to Vermont and Manitoba south to Connecticut, Pennsylvania, Illinois and Missouri. Flowering in July and August.

The St Peter's-wort (Ascyrum stans Michaux) and the St Andrew's Cross (Ascyrum hypericoides Linnaeus), two small, leafy, shrubby species of the coastal region, differ from the species of

Hypericum by having four instead of five petals, as pointed out above in the key to the species of the family.

Elliptic-leaved or Pale Saint John's-wort

Hypericum ellipticum Hooker

Plate 130b

Stems herbaceous, slightly four-angled, mainly simple or with a few branches, erect, 6 to 20 inches high from a perennial root. Leaves oval or elliptic, sessile, spreading, thin in texture, three-fourths to $1\frac{1}{4}$ inches long and one-fourth to one-half of an inch wide, blunt at the apex. Flowers pale yellow, few or several in terminal cymes, each flower about one-half of an inch broad, central flower of each cluster opening first, the lateral branches of the cluster developing later; sepals slightly shorter than the petals; styles three, united below; capsules or fruit ovoid-globose, about one-eighth of an inch long and one-celled. Sepals and petals occasionally four instead of five.

In low grounds, swamps and along streams, Nova Scotia to Manitoba, south to New Jersey, Maryland and Minnesota. Flowering in July and August. Our illustration was made from plants just beginning to flower, before the lateral branches of the cyme were developed.

Common Saint John's-wort

Hypericum perforatum Linnaeus

Plate 131a

Stems herbaceous, smooth, slender, 1 to 2 feet high from a perennial root, usually much branched and with several barren shoots at the base. Leaves sessile, linear or oblong, one-half to 1 inch long, one-tenth to one-third of an inch wide, blunt, black dotted. Flowers three-fourths to 1 inch broad, bright yellow, several or many in terminal cymes; petals five, black dotted, longer than the lanceolate pointed sepals; stamens numerous, united by their base into three sets; styles three; fruit pod or capsule ovoid, about one-fourth of an inch long or less, three-celled.

A. GREAT OR GIANT SAINT JOHN'S-WORT
Hypericum ascyron

B. ELLIPTIC-LEAVED OR PALE SAINT JOHN'S-WORT
Hypericum ellipticum

A. COMMON SAINT JOHN'S-WORT
Hypericum perforatum

B. FROSTWEED; ROCKROSE
Crocanthemum canadense

Native of Europe and naturalized as a weed in fields and waste places throughout the East.

Rockrose Family

Cistaceae

Frostweed; Rockrose

Crocanthemum canadense (Linnaeus) Britton

Plate 131b

Stems erect or diffuse from a perennial root, 5 to 20 inches high, finely canescent and becoming branched. Leaves nearly sessile, linear-oblong to oblanceolate, one-half to 1½ inches long, one-third of an inch wide or less, green above, canescent beneath. Flowers bright yellow, usually one or two, 1 to 1½ inches broad; sepals five, the two outer ones much smaller; petals five, broadly obovate, soon withering and falling; capsule ovoid, about one-third of an inch long. After the petaliferous flowers fade and fall, the axillary branches elongate and bear numerous apetalous sessile flowers, which develop fruiting capsules about one-sixth of an inch in diameter.

In sandy fields or rocky soil, Maine to Ontario and Wisconsin, south to North Carolina and Mississippi. Flowering from May to July.

A closely related species of similar situations, Crocanthemum majus (Linnaeus) Britton, is more canescent, the primary flowers clustered at the summit of the stem and not surpassed by the branches; the secondary or apetalous flowers very small and producing capsules which are only about one-twelfth of an inch in diameter.

Woolly Hudsonia; False Heather

Hudsonia tomentosa Nuttall

Plate 132a

A diffusely branched, low-tufted or matted perennial, somewhat woody, 3 to 8 inches high, pale and hoary-pubescent, the branches stout and ascending. Leaves small and scalelike, about one-tenth or one-twelfth of an inch long, overlapping one another and appressed to the stem. Flowers numerous, almost sessile or on short, stout stalks less than one-fourth of an

inch long, yellow, about one-fourth of an inch broad or slightly less; petals five, obovate-oblong; stamens numerous, nine to eighteen in number; sepals blunt. Fruit a small, ovoid, smooth and one-seeded capsule.

In sandy pine barrens and sandy shores along the coast, New Brunswick to Virginia and inland on sand hills and lake and river shores, west to Manitoba and North Dakota. Flowering from May to July.

Violet Family

Violaceae

Because of their abundance and beauty, the violets take rank with the favorites among our native flowers. Our species of violets are all low herbs, either leafy-stemmed or stemless, that is, the leaves and flowers arising directly from the rootstock. The flowers possess five stamens, the two lowest with appendages that project into the spur or nectar sac of the lower and odd petal. Only these two stamens are developed in the apetalous flowers which come after the petaliferous flowers in most stemless species except the Bird's-foot Violet. The petaliferous flowers are somewhat irregular, the lower petal extended into a spur or sac back of the flower, the lateral petals usually narrower than the two upper petals, and usually only the spur and lateral petals adorned at the base in some species with hairs.

Allied species of some groups freely hybridize when growing together. The hybrids commonly display characters more or less intermediate to those of the parent species, and show marked vegetative vigor, but very often also impaired fertility. These violets of hybrid origin are frequently unlike the mother plant and unlike one another, reverting variously in succeeding generations to the characters of the two original species.

Two cultivated species of violets are common in the east, and sometimes escape from cultivation. They are the English, Marsh or Sweet Violet (Viola odorata Linnaeus), and the Pansy or Heartsease (Viola tricolor Linnaeus) with variously colored flowers. The original form, and the one which the cultivated forms revert to sooner or later, has violet or purple flowers. The large Garden Pansy is the product

A. WOOLLY HUDSONIA; FALSE HEATHER

Hudsonia tomentosa

B. DWARF GINSENG OR GROUNDNUT

Panax trifolium

of various crosses of Viola tricolor with allied species of the Old World. In addition to these, there are about thirty-three native species of violets in New York, beside the many natural hybrids. The following key to the native species may be useful in determining certain species not illustrated here.

1 Stemless; the leaves and scapes directly from a rootstock or from runners
  Petals bright yellow; leaves orbicular. . . . . 1 V. rotundifolia
  Petals violet, purple or white
    Cleistogamous flowers wanting; petals all beardless; leaves divided . . . . . 2 V. pedata
    Cleistogamous flowers present, at least later in the season
      Rootstock thick, often stout, without stolons; lateral petals bearded
        Cleistogamous flowers ovoid on short prostrate peduncles; their capsules mostly purplish
          Leaves except rarely the earliest, palmately five- to eleven-lobed or parted; foliage villous-pubescent
            Leaf-lobes blunt, lateral ones broad. . . . . 3 V. palmata
            Leaf-lobes acuminate, lateral ones linear. . . 4 V. perpensa
          Early and late leaves uncut; others three- to seven-lobed or parted 5 V. triloba
          Leaves all uncut; blades ovate to reniform, cordate, crenate-serrate
            Plants nearly or quite glabrous; petals violet-purple; seeds brown
              Petioles smooth; plants of moist soil. . . . . 6 V. papilionacea
              Petioles glandular roughened; plants of dry soil. . . . . 7 V. latiuscula
            Leaves very hairy, especially beneath and on the petioles; seeds dark brown. . . . . 8 V. sororia
            Leaves hirsutulous above, otherwise smooth; seeds buff. . . . . 9 V. hirsutula
        Cleistogamous flowers ovoid on ascending peduncles, soon elongated
          Leaves pubescent beneath and on the petioles; sepals and their auricles ciliolate; blades broadly ovate, cordate. . . . . 10 V. septentrionalis

Leaves glabrous beneath and on the petioles. . . . . 11 V. affinis

Cleistogamous flowers on erect peduncles, their capsules green

Leaves broadly ovate, blunt at the apex; sepals obtuse

Cleistogamous flowers ovoid; spurred petal villous. . . . . 12 V. nephrophylla

Cleistogamous flowers long and slender, spurred petal glabrous 13 V. cucullata

Leaves lobed or the margins sharply incised or toothed toward the subcordate or truncate base; spurred petal villous, lateral ones with capillary beard

Blade of the mature leaves ovate-oblong, ciliate, finely pubescent; petioles short. . . . . 14 V. fimbriatula

Blade of the mature leaves lanceolate, usually smooth; petioles long. . . . . 15 V. sagittata

Blade of the mature leaves broadly ovate or deltoid

Margin coarsely toothed near the base; blades sometimes lobed. . . . . 16 V. emarginata

Margin sharply toothed toward the base and more or less pectinately incised. . . . . 17 V. pectinata

Blade of mature leaves primarily three-lobed or three-parted, the segments two to three-cleft into linear or oblanceolate lobes. . . . . 18 V. brittoniana

Rootstock slender (or thicker and scaly with age); plants usually from stolons

Petals pale violet; leaves minutely hairy on the upper surface; spur large, 3 lines long. . . . . 19 V. selkirkii

Petals white, with dark purple lines on the lower three

Cleistogamous capsules ovoid, usually purplish; woodland plants

Leaves reniform, lateral petals beardless; stolons short. . . . . 20 V. renifolia

Leaves broadly ovate, acute; lateral petals bearded; seeds obtuse at the base. . . . . 21 V. incognita

Leaves ovate, acute or acuminate; lateral petals beardless; seeds acute at base. . . . . 22 V. blanda

Cleistogamous capsules ellipsoid; always green; peduncles erect; bog and wet meadow species

Leaves broadly ovate or orbicular, cordate, obtuse. . . . . 23 V. pallens

Leaves oblong to ovate, the base slightly cordate to tapering 24 V. primulifolia

Leaves lanceolate to elliptical. . . . . 25 V. lanceolata

2 Leafy-stemmed; the flowers axillary

Style capitate, beakless, bearded near the summit, spur short; stipules nearly entire, soon scarious

Petals yellow

Sparingly pubescent; root-leaves usually one to three. . . 26 V. eriocarpa

Markedly pubescent; root-leaves usually wanting. . . . 27 V. pubescens

Inner face of the petals white with yellow base, outer face usually violet; leaves usually broadly ovate, acuminate, subglabrous. . . . . 28 V. canadensis

Style not capitate; spur long; stipules bristly toothed, herbaceous

Spur 2 to 4 lines long; lateral petals bearded; styles bent at tip, with short beard

Petals white or cream-colored. . . . . 29 V. striata

Petals violet-blue

Herbage glabrous or nearly so; leaves orbicular or suborbicular

Stipules ovate-lanceolate, bristly serrate; leaves often $1\frac{3}{4}$ inches wide. . . . . 30 V. conspersa

Stipules linear, entire except at base; leaves not over three-fourths of an inch wide; alpine. . . . . 31 V. labradorica

Herbage puberulent; stems ascending; blades mostly ovate. . . . . 32 V. adunca

Spur 4 to 6 lines long, lateral petals beardless; style straight and smooth. . . . . 33 V. rostrata

Style much enlarged upward into a globose, hollow summit; stipules large, leaflike, pectinate at base; upper leaves and middle lobe of stipules entire or nearly so; dry sandy places. . . . . 34 V. rafinesquii

Bird's-foot Violet

Viola pedata Linnaeus

Plate 133

Leaves nearly smooth from a short, stout, erect rootstock, three-divided, the lateral divisions pedately three to five-parted or cleft, the

segments linear to spatulate, often two to four-cleft or toothed near the apex. Early leaves usually smaller and less deeply dissected. Corolla two-thirds to 1½ inches broad, the upper petals dark violet, the lower three lilac-purple, or as in the common northern variety (var. lineariloba DeCandolle) here illustrated, all the petals lilac-purple, all beardless, the orange tips of the stamens large and conspicuous in the center of the flower. Seed pods smooth, green; seeds copper-colored.

Apetalous or cleistogamous flowers are never formed in this species, but petaliferous flowers are frequent in late summer and autumn.

Common in dry or sandy fields and open woods from Massachusetts to Florida and Louisiana, less abundant or locally common inland to Minnesota. Flowering in May and June.

Early Blue or Palmate-leaved Violet

Viola palmata Linnaeus

Plate 134a

Leaves palmately five to eleven-lobed or parted, erect or nearly so, from a thick, usually oblique, simple or branched rootstock, the leaf segments variously toothed or cleft, the middle segment usually the widest, more or less villous beneath, especially on the veins and on the petioles, the upper surface of the leaves often smooth; early leaves smaller and usually less divided than the later ones. Flowers on stalks about as long as the leaves, two-thirds to 1 inch broad, violet-purple; sepals blunt; cleistogamous flowers on prostrate peduncles; seeds brown.

In woods and thickets, rarely in open fields and most abundant in rather dry, rich soil on wooded hills, Massachusetts to Minnesota, south to Florida. Flowering from April to June. Like several of the other blue-flowered violets it is locally known as Johnny-jump-up.

Among its close relatives in the east is Viola triloba Schweinitz, in which the earliest leaves and those put forth in late summer are usually with uncut, reniform, cordate blades, the summer leaf blades 4 to 6 inches wide, densely villous beneath and on the petioles, three-lobed or three-parted.

BIRD'S-FOOT VIOLET

Viola pedata var. *linariloba*

A. EARLY BLUE OR PALMATE-LEAVED VIOLET
Viola palmata

B. SMOOTHISH YELLOW VIOLET
Viola eriocarpa

Viola perpensa Greene, of the Great Lakes region, possesses linear, acuminate lateral leaf lobes.

Coast or Britton's Violet

Viola brittoniana Pollard

Plate 136b

Early leaves reniform to ovate in outline, entire or incised, from a thick, erect rootstock; mature leaves three-parted and the segments two to four-cleft into linear or oblanceolate, acute lobes, the middle lobe somewhat the widest; smooth except for minute pubescence on the upper surface and margin. Flowering scapes as long or longer than the leaves. Flowers large, 1 to 1½ inches broad, rich purple with a conspicuous white throat. Sepals linear-lanceolate, acuminate.

In peaty or moist, sandy soil along the coast, southern Maine to Virginia. Flowering in May and June. Next to Viola pedata, one of the most showy of our native species of violet.

Woolly Blue Violet; Sister Violet

Viola sororia Willdenow

Plate 135a

Leaves ovate to orbicular from a stout, simple or branched rootstock; petioles and under surfaces of the young leaves, and often the scapes, villous-pubescent; leaf blades blunt or pointed, heart-shaped, the margins crenate-serrate, sometimes becoming 4 inches wide when mature. Corolla violet to lavender, and occasionally white; sepals broad, usually blunt, finely ciliate below the middle; petals rather broad, the lower and lateral ones densely bearded with white toward the center of the flower. Cleistogamous flowers ovoid on short, horizontal peduncles, usually underground, but lengthening and ascending as the capsule ripens; capsules green, mottled with brown; seeds dark brown.

In rocky or rich woodlands, moist meadows and on shady ledges, Quebec to Minnesota, south to North Carolina. Flowering in April and May.

Quite as abundant is the Meadow or Hooded Blue Violet (Viola papilionaeea Pursh) with nearly glabrous foliage, very large leaf blades which are reniform or ovate, deep-blue flowers, the odd petal often narrow and boat-shaped, usually beardless; capsules ellipsoid, green or dark purple. Common in moist fields and groves, frequently about dwellings.

The Broad-leaved Wood Violet (Viola latiuseula Greene) possesses broadly ovate-deltoid leaf blades, the earliest ones blunt and tinged with purple beneath; petioles glandular-roughened; flowers violet-purple. In dry, open woods in sand or gravel.

The Southern Wood Violet (Viola hirsutula Brainerd) enters our range only in southern New York. It is a small species with leaves lying close to the ground, the blades orbicular to reniform, purplish beneath, silvery pubescent above; flowers reddish purple.

The Northern Wood Violet (Viola septentrionalis Greene) is common in moist, open woodlands south to Connecticut and Pennsylvania. The foliage, except the earliest leaves, is hirsutulous. The leaf blades are ovate to reniform, heart-shaped, ciliate and blunt; sepals blunt, closely ciliolate nearly to the tip; flowers deep violet to pale lilac.

LeConte's Violet

Viola affinis LeConte

Plate 135b

Foliage nearly or quite smooth; rootstocks slender, branching, or the plants growing in matted clusters. Early leaves narrowly ovate and heart-shaped, more or less long pointed toward the apex, the margins crenate-serrate; petioles slender and smooth. Flowers violet with a conspicuous white center; the cleistogamous flowers small, on ascending stalks.

Common in moist meadows, low woodlands and shady borders of streams, New England to Wisconsin, south to Georgia and Alabama. Flowering from April until June. The mature leaves of midsummer are about 2 inches wide.

The Northern Bog Violet (Viola nephrophylla Greene) resembles LeConte's Violet in some respects, but the leaves are broader and more blunt. It occurs in cold, mossy bogs and sometimes along borders of streams and lakes from Quebec to British Columbia south to Connecticut and Wisconsin. It appears to be abundant in a bog in Bergen swamp, Genesee county.

A. WOOLLY BLUE VIOLET
Viola sororia

B. LECONTE'S VIOLET
Viola affinis

A. TRIANGLE-LEAVED VIOLET
Viola emarginata

B. COAST OR BRITTON'S VIOLET
Viola brittoniana

Marsh Blue Violet

Viola cucullata Aiton

Plate 138b

Leaves and stems smooth or nearly so; leaf blades, except the earliest, broadly ovate to reniform, heart-shaped at the base, the margins strongly cucullate (rolled inward) when the leaves are young, the apex pointed, margins crenate-serrate; when mature 2 to 4 inches broad. Flowering stalks much longer than the leaves. Flowers violet-blue with a dark-blue throat or center, or sometimes entirely white; lateral petals bearded, the lower or spur petal smooth and usually shorter than the lateral ones. Cleistogamous flowers on long, slender, erect stalks, their capsules green; seeds nearly black.

In moist meadows, springy places in woodlands and along streams, Quebec to Georgia. Flowering from late in April until June.

Ovate-leaved Violet

Viola fimbriatula J. E. Smith

Plate 137a

Rootstock long and stout, sometimes branching. The earliest leaf blades ovate and blunt; the later ones oblong-ovate, acute, finely pubescent, especially beneath, the margins crenulate toward the apex, the bases usually somewhat heart-shaped or truncate and sharply toothed, incised or auriculate. Flowering stalks about as long as the leaves when first in bloom or longer than the leaves in later flowers; the corolla violet-purple. Capsules green; seeds brown. Cleistogamous flowers on erect peduncles.

Dry fields and hillsides, throughout the eastern states and south to Georgia. Flowering in May and June.

Arrow-leaved Violet

Viola sagittata Aiton

Plate 137b

Leaves erect from a stout rootstock, smooth, or sometimes ciliate or finely pubescent; their petioles longer than the blades which are lanceolate

or oblong-lanceolate, 1 to 4 inches long, truncate or heart-shaped at the base and blunt or pointed at the apex, the base hastately or sagittately toothed or cleft, the earliest leaves often deltoid-ovate, blunt, and merely crenate at the base. Flowers on stalks about as long as the leaves, the corolla violet-purple.

Moist banks, fields and wet meadows, Massachusetts to Minnesota, south to Georgia and Louisiana. Flowering in May and June. The smooth form appears to be the commoner on the coastal plain, while around the Great Lakes region and eastward to the Hudson River valley occurs a form with pubescent foliage.

Triangle-leaved Violet

Viola emarginata (Nuttall) LeConte

Plate 136a

Foliage glabrous, succulent, frequently in dense tufts from stout or matted rootstocks. Leaf blades at flowering time narrowly ovate or triangular, slightly heart-shaped; the later ones broadly ovate or deltoid, 1 to 3 inches wide, often as broad as long, the base truncate or slightly heart-shaped, coarsely toothed or incised toward the base. Flowering scapes usually longer than the leaves; flowers violet-blue, the petals often notched at the ends.

Dry woods, hillsides and fields, southern New York southward. Flowering in April and May.

Viola emarginata aeutiloba Brainerd, found on Staten Island, possesses leaf blades (of mature leaves) which are five-cleft or five-parted, the middle lobe long and narrow, the lateral ones shorter and narrower than the middle lobe.

Closely related to the Triangle-leaved Violet is the Cut-leaved Violet (Viola pectinata Bicknell) in which the blades of the mature leaves are ovate-deltoid, wider than long, the margin deeply dentate or pectinate with numerous small linear acute, entire lobes. Low meadows and edges of salt meadows near the coast.

A. OVATE-LEAVED VIOLET
Viola fimbriatula

B. ARROW-LEAVED VIOLET
Viola sagittata

A. MEADOW BEAUTY; DEER GRASS
Rhexia virginica

B. MARSH BLUE VIOLET
Viola cucullata

Great-spurred or Selkirk's Violet

Viola selkirkii Pursh

Plate 139a

Leaves and scapes 2 to 4 inches high from a slender rootstock or stolon. Leaf blades thin, crenate margined, ovate to suborbicular, deeply heart-shaped, the basal lobes converging or overlapping; leaves small at flowering time, when mature 1 to $2\frac{1}{2}$ inches wide, smooth except for minute, spreading hairs on the upper surface of the leaves. Flowers pale violet, not bearded, the spur $2\frac{1}{2}$ to 4 lines long and much enlarged toward the rounded end.

In shaded ravines and cool mountain forests, New Brunswick to Pennsylvania and Minnesota, north to Greenland. In central New York its favorite habitat is the moss-covered rocks and boulders beneath limestone cliffs and shaded by dense forests of mixed hardwoods and hemlock. Flowering in April and May.

Large-leaved White Violet

Viola incognita Brainerd

Plate 139b

Foliage somewhat pubescent with soft, white hairs, especially when young, upper leaf surfaces smooth. Leaves ascending from slender rootstocks. Leaf blades at flowering time orbicular or reniform, two-thirds to 2 inches wide, abruptly short pointed at the apex, cordate at the base; summer leaves with large, somewhat roughened blades, broadly ovate, cordate with an open sinus, acute, 2 to 4 inches wide or larger. Flowers white, on stalks as long as the leaves at flowering time, the lateral petals bearded, the upper pair obovate; seeds brown. In summer the plants produce numerous filiform runners.

Mountainous and low, moist woodlands, Newfoundland to Dakota and south to Tennessee.

The Kidney-leaved White Violet (Viola renifolia A. Gray) is densely pubescent throughout, with reniform leaf blades which are distantly crenate-serrate on the margins and rounded at the apex; petals white, all beardless, the three lower with brownish veins. In Arbor Vitae

swamps and cold woods, Newfoundland to Mackenzie river, south to Pennsylvania and Minnesota and along the Rocky mountains to Colorado.

The Sweet White Violet (Viola blanda Willdenow) has the petioles and scapes smooth and often tinged with red; smaller leaves, longer flowering stalks with very fragrant white flowers; lateral petals beardless, the upper pair of petals often long, narrow and strongly reflexed or sometimes twisted; seeds dark brown and minutely roughened.

The Northern White Violet (Viola pallens (Banks) Brainerd) has small, broadly ovate or orbicular, smooth, pale-green leaves; scapes much longer than the leaves, bearing white, slightly fragrant flowers. Common in mossy bogs and wet meadows.

Primrose-leaved Violet

Viola primulifolia Linnaeus

Plate 140a

Leaf blades oblong to ovate, obscurely crenate-serrate on the margins, smooth or somewhat hairy, especially toward the base of the petioles; the leaves and flower stalks arising from slender rootstocks or stolons. Flowering scapes 2 to 10 inches high, usually longer than the leaves. Flowers white, the three lower petals purple-veined, the lateral ones slightly or not at all bearded; capsules green; seeds reddish brown. Numerous leafy stolons are developed in late summer.

A frequent violet of moist, open, especially sandy soil near the coast from New Brunswick to Florida and Louisiana. Flowering in May and June.

Lance-leaved or Water Violet

Viola lanceolata Linnaeus

Plate 140b

Foliage smooth and plants usually profusely stoloniferous in late summer, the stolons rooting at the nodes and bearing numerous apetalous flowers; the rootstocks slender. Flowering stalks 2 to 4 inches high or higher; mature leaves lanceolate or elliptical in shape, the blade 2 to 6 inches long and one-eighth to three-fourths of an inch wide, tapering gradually below into the margined reddish petiole; margins of the leaves obscurely crenulate. Flowers white, the three lower petals striped with purplish veins. Fruiting capsules green; seeds dark brown.

A. GREAT-SPURRED OR SELKIRK'S VIOLET
Viola selkirkii

B. LARGE-LEAVED WHITE VIOLET
Viola incognita

A. PRIMROSE-LEAVED VIOLET
Viola primulifolia

B. LANCE-LEAVED OR WATER VIOLET
Viola lanceolata

Open bogs, marshes and moist meadows, Nova Scotia to Minnesota and southward. Flowering in May and June or sometimes as early as the latter part of April.

The Round-leaved Yellow Violet (Viola rotundifolia Michaux) possesses oval or orbicular, blunt leaves, heart-shaped with repand-crenulate margins; at flowering time about 1 inch wide; in midsummer 2 to 4 inches wide and flat upon the ground; flowers bright yellow, the three lower petals with brown lines. In cold woods, Maine to Ontario, south to Georgia. Very common in the Adirondack and Catskill mountains. In other parts of the State rather rare or local.

Smoothish Yellow Violet

Viola eriocarpa Schweinitz

Plate 134b

Commonly with two to four ascending stems from a single rootstock. Basal leaves often several, long petioled with ovate to reniform blades, smooth except for minute pubescence on the upper part of the stem and on the lower leaf surfaces along the veins; the stems bearing one to three short-petioled leaves, each broadly ovate, slightly heart-shaped at the base and long pointed at the apex, the uppermost ones smaller and nearly sessile. Flowers in the upper axils, yellow, the lateral petals bearded. Fruiting capsules ovoid, woolly white or rarely nearly smooth; seeds brown.

In low, open, moist woods, Nova Scotia to Manitoba, south to Georgia and Texas. Flowering in May and June.

The closely related Hairy or Downy Yellow Violet (Viola pubescens Aiton) is softly pubescent throughout; stems usually but one from a rootstock; usually without basal leaves, but bearing one to three leaves on the stem, which are broadly ovate or reniform. In dry, rich woods, Nova Scotia to Dakota, south to Virginia and Missouri.

Canada Violet

Viola canadensis Linnaeus

Plate 141

Stems 6 to 18 inches high, usually several or many together from a perennial root, smooth or nearly so. Leaves broadly ovate, heart-shaped,

pointed at the apex, the margins toothed. Basal leaves numerous on long petioles. Flowers in the axils of the stem leaves, often appearing throughout the season from May to July, whitish with a bright-yellow eye, the upper petals more or less tinged with violet on the outside, the lower petal striped with fine, dark lines.

In upland and mountainous forests, New Brunswick to Saskatchewan, south to South Carolina and Alabama.

The Pale or Striped Violet (V i o l a s t r i a t a Aiton) possesses less ascending and more angular stems than V. e a n a d e n s i s, 6 to 12 inches high when in flower; the flowers white or cream-colored, densely bearded in the center. In low and shaded places, New York to Minnesota, south to Georgia.

American Dog Violet

Viola conspersa Reichenbach

Plate 142b

Usually several stems ascending from an oblique, branched rootstock, 3 to 6 inches long at flowering time. Leaf blades orbicular, heart-shaped, crenate-serrate on the margins, blunt, one-half to 2 inches wide, the upper ones smaller and more pointed. Flowers numerous, usually pale violet or rarely white, raised above the leaves on axillary stalks, 2 to 3 inches long.

Common in low ground or moist, shaded woods, Quebec to Minnesota, south to Georgia. Flowering from early spring until late in May.

Closely related, but more dwarfed, with small, orbicular blades and deep violet flowers is the Alpine Dog Violet (V i o l a l a b r a d o r i c a Schrank) occurring in New York only on the higher mountains of the Adirondacks.

The Sand Violet (V i o l a a d u n c a J. E. Smith; V. s u b v e s t i t a Greene) is finely puberulent, the stems only 2 to 6 inches long; leaf blades ovate, one-half to 1 inch long, crenulate, blunt, subcordate; flowers deep violet, with a straight, blunt spur about 3 lines long. Rather local in sandy or sterile soil or on dry stony ridges, Quebec to Maine and westward.

CANADA VIOLET

Viola canadensis

Long-spurred Violet

Viola rostrata Pursh

Plate 142a

Stems usually numerous from an elongated, jointed rootstock, 4 to 8 inches high. Leaves orbicular to broadly ovate, heart-shaped, nearly or quite smooth, serrate on the margins, the upper ones pointed, the lower and basal leaves blunt. Petaliferous flowers on long, slender stalks, violet with a dark purple-violet center, not bearded, the spur slender and one-half of an inch long or longer.

Shady hillsides and moist woods in leaf mold, Quebec to Michigan, south to Georgia. Flowering in May and June.

The Field Pansy (Viola rafinesquii Greene) is an annual plant with slender, smooth, erect stems, 3 to 8 inches high, sometimes branched. Leaves small, somewhat rounded on slender petioles; their stipules large, conspicuous and deeply cut or fringed. Flowers small, bluish white to cream-colored. In fields and open woods, southern New York to Michigan and southward to Georgia and Texas. Flowering in April and May.

Loosestrife Family

Salicariaceae

(Lythraceae)

The Swamp Loosestrife and the Spiked or Purple Loosestrife belong to this family, which in addition to these two species illustrated here, is represented in this State by two smaller flowered species of Lythrum (Lythrum hyssopifolia Linnaeus and L. alatum Pursh) and the Clammy Cuphea or Blue Waxweed (Parsonsia petiolata (Linnaeus) Rusby).

Swamp Loosestrife; Willow-herb

Decodon verticillatus (Linnaeus) Elliott

Plate 143a

An herblike perennial growing usually in swamps or shallow water. Although appearing like an herbaceous plant it is more or less shrubby. The stems are angular, recurved, smooth and somewhat woody below, 3 to 10 feet long, often rooting at the tip when they reach the soil or mud. Leaves lanceolate, opposite or verticillate, 2 to 5 inches long, one-third

to 1 inch wide, smooth above, somewhat hairy beneath, pointed at both ends, on very short petioles. Flowers numerous in cymelike axillary clusters; ealyx broadly campanulate; corolla about an inch or less broad, petals euneate at the base, pink-purple, the slender filaments of the stamens projeeting from the flower. Fruiting capsule about one-fourth of an inch in diameter or slightly less.

In swamps, shallow water around the edges of lakes and ponds, or along slow streams, often forming thickets, Maine to Florida, west to Minnesota, Tennessee and Louisiana. Flowering in June and July. Also known as peatweed or slink-weed, wild oleander and grass poly.

Spiked or Purple Loosestrife

Lythrum salicaria Linnaeus

Plate 143b

Stems four-angled, 2 to 4 feet high or sometimes taller from a perennial root, smooth or somewhat pubeseent or tomentose above and more or less branched. Leaves opposite or sometimes in threes, sessile, lanceolate, clasping and heart-shaped at the base 2 to 3 inches long, one-fourth to one-half of an inch wide. Flowers purple, one-half to two-thirds of an ineh long and half as broad, in dense, terminal, branched racemes interspersed with numerous small leaves; petals four or five, usually five; stamens eight or ten, the longer ones scarcely projecting beyond the flower.

Native of Europe but thoroughly naturalized and common in wet plaees and swamps throughout the east. Very common along the Hudson river from Albany to New York. Flowering in July and August.

Meadow Beauty Family

Melastomaeeae

Meadow Beauty; Deer Grass

Rhexia virginica Linnaeus

Plate 138a

Stems square, 8 to 18 inches high, the angles of the stem usually slightly winged, hairy or nearly smooth; roots perennial and fibrous with a few small

A. LONG-SPURRED VIOLET
Viola rostrata

B. AMERICAN DOG VIOLET
Viola conspersa

A. SWAMP LOOSESTRIFE; WILLOW-HERB
Decodon verticillatus

B. SPIKED OR PURPLE LOOSESTRIFE
Lythrum salicaria

tubers. Leaves opposite, sessile or nearly so, ascending, ovate or elliptical-ovate, pointed at the apex, narrowed or rounded at the base, 1 to 2 inches long, one-half to 1 inch wide, with a few scattered hairs on both surfaces, conspicuously three to five-nerved, the margins ciliate-serrulate. Flowers bright purple, 1 to $1\frac{1}{2}$ inches broad, few or several in terminal clusters; calyx-tube urn-shaped, constricted above with four triangular-pointed lobes, and like the stalk of the flower glandular-pubescent; petals four, broadly obovate; stamens eight, equal; anthers yellow, linear, curved and minutely spurred on the back. Fruit a four-celled, four-valved capsule with numerous small rough, bent seeds.

In moist, sandy meadows and marshes, Maine to northern New York, Ontario and Iowa, south to Florida, Louisiana and Missouri. Flowering from July to September. Common on the coastal plain, but rare or local inland, except east and north of Oneida lake, where it is very abundant in certain places.

The Maryland Meadow Beauty (R h e x i a m a r i a n a Linnaeus) occurs from Long Island southward. It is more densely hairy, the stems are not angled and the leaves are narrower and more spreading.

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